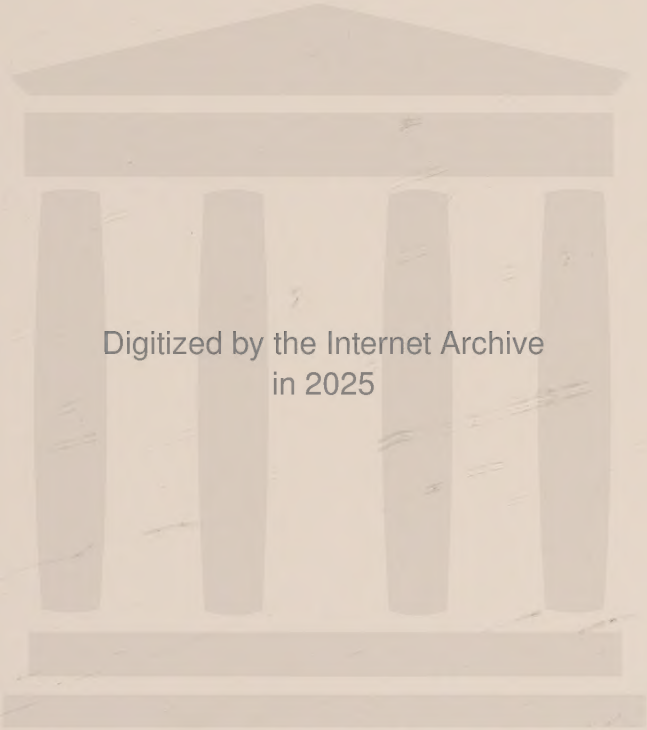
Mary Duncan.

Xmas 1926
Auntie Bertha.

THE DRAWING AND CONSTRUCTION OF ANIMALS



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HORSE'S HEAD

[*Frontispiece.*

THE DRAWING AND CONSTRUCTION OF ANIMALS

BY
W. EVANS LINTON, R.W.A.

WITH ILLUSTRATIONS BY
THE AUTHOR AND E. L. BECKLES

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TO

J. L.

WITHOUT WHOSE ENCOURAGEMENT
THIS BOOK
WOULD NEVER HAVE BEEN WRITTEN

NOTE

The author desires to express his indebtedness to Mr. V. P. Roberts for his kind and valuable supervision of the text.

PREFACE

The fact that, although there are numerous works dealing with almost every aspect of draughtsmanship, there exists no illustrated treatise on drawing animals, has recently been pointed out to me by my friends, and they have further been flattering enough to suggest that I possess the requisite knowledge to supply this deficiency.

I have accordingly in this work endeavoured to place in the hands of the practical student a work in some degree comparable with the text books at the service of the student of the human figure.

My object has been to set down in as simple words as possible some truths, the result of many years of study and observation, which it is hoped will prove useful to all interested in this important branch of art. Had I, when making my initial efforts, been in possession of the information which I have tried to impart in the following pages, my progress would, undoubtedly, have been accelerated.

An attempt has been made here to describe with accuracy the various parts of the horse, cow, sheep, dog and cat, and to compare the

construction and proportions of these animals with each other.

Although it has been found necessary for the sake of brevity in describing the various forms, to introduce many anatomical terms, this work is in no wise an anatomy book; in the instances when the use of such terms have been resorted to, a chart has been included, with a key, furnishing a ready means by which the reader may become cognisant of the parts referred to.

A thorough understanding of the fundamental principles of the construction of the animal if not absolutely indispensable, is of primary importance to the serious student; but anyone desirous of obtaining exhaustive anatomical knowledge is advised to extend his researches to other works, of which there are several, dealing exclusively, and in detail, with this subject.

While this book is specially designed for the use of the student, the author ventures to hope that it may prove serviceable to the painter and illustrator, the diagramatic illustrations affording a convenient means by which they may refresh their memories, or help to conjure up a mental picture of the part which they experience difficulty in delineating.

It is possible that I may have laid myself open to the adverse comments of my numerous critics by advocating the use of the camera as an aid to the study of animals, but experience shows us that funds of valuable knowledge can be acquired through discriminating study of good photo-

graphs. To draw animals well is so difficult that the employment of any means to accumulate knowledge which will assist to the realisation of our end is justified.

It is with no small misgiving that I plunge into the unaccustomed medium of words to attempt to describe that which in the practice of my calling I have hitherto expressed to the best of my ability in paint, and it must be stated quite frankly that no claim is laid to literary attainment, and the most that is attempted is but a plain statement of facts and a few warnings which, if heeded, may justify the existence of this work, by helping the reader to commence his studies of an exacting subject ready equipped with sound knowledge, the acquisition of which might have cost him a long period of unaided effort.

CONTENTS

CHAPTER		PAGE
I.	The Horse: Importance of Knowledge of Construction	1
II.	The Cow	82
III.	Sheep	160
IV.	The Dog	195
V.	The Cat	229

LIST OF ILLUSTRATIONS

	FACING PAGE
Horse's Head	*Frontispiece*
Skeleton of a Horse	6
Horse's Head	8
Horses' Heads	10
Horses' and Colts' Heads	28
The Horse	30
Shoulder and Near Fore Limb	36
The Drinking Pool	48
Hindquarters—Showing Resting Legs	60
Hindquarters—Resting and Normal Position	62
Delicate Attentions	84
The Cow	89
Skeleton of a Cow	92
Cows' Heads	100
Calves' Heads	106
Diagrammatic Drawing to Show Principal Planes	129
Bull's Head	140
Oil Sketch from Nature	142
Sunlit Pastures	146
Calves' Heads	150
Notes from Nature	156
Pencil Sketches of Sheeps' Heads	170
Skeleton of a Dog	195
Greyhound	221
Smooth-coated Labrador and Bulldog	222
Cats' Heads	235
Cats' Heads	240

CHAPTER I

THE HORSE

IMPORTANCE OF KNOWLEDGE OF CONSTRUCTION

Before a beginner can hope to draw from the live horse with any degree of success, it is desirable for him to acquire some knowledge of the animal's proportions and mechanism. A course of study from the cast is generally prescribed for the student of the human figure before he is admitted to the life class; if this is necessary for the study of the human figure which will be posed for a fixed period in one position, how much more necessary is it for the student to approach the study of an animal, rarely still for more than a few minutes, armed with some fundamental understanding of its construction? Much of this knowledge may be acquired by the careful study of the numerous casts of animals which are published, which may be obtained at a moderate cost; but if these are not available, good photographs or good drawings may be used with beneficial results, from which the student may familiarise himself

with the general construction and proportions of the animal. Where casts are studied, it is desirable to draw from large scale specimens, as the smaller ones, though very useful for learning the general proportions, have been cast and recast so often that much of the original form has been lost or is partially obliterated by the marks of the mould.

PROPORTIONS

Fig. 1 is a diagrammatic drawing, illustrating some of the proportions of the horse, that should be a guide to the beginner. Note first, that the body and legs of a horse in profile may be fitted into a square, the side of which measures rather more than the length of two and a half heads. The line AB touches the shoulder on the one side of the square and the line CD touches the buttock and fetlock on the opposite side. It will be observed that the line BC is horizontal and touches the top of the withers and the top of the hindquarters; this is of course subject to variation in different individuals, a horse frequently being a trifle higher at the withers. The lines EF, HJ, LM, PQ are equal to one head respectively, in an average horse of the light vanner, charger or heavy weight hunter type. The measurement that is subject to the most variation is LM, to which I shall refer later. From F to the point of the buttock is well over three-quarters of a head: from K to N about three-quarters of a head—more in a race horse.

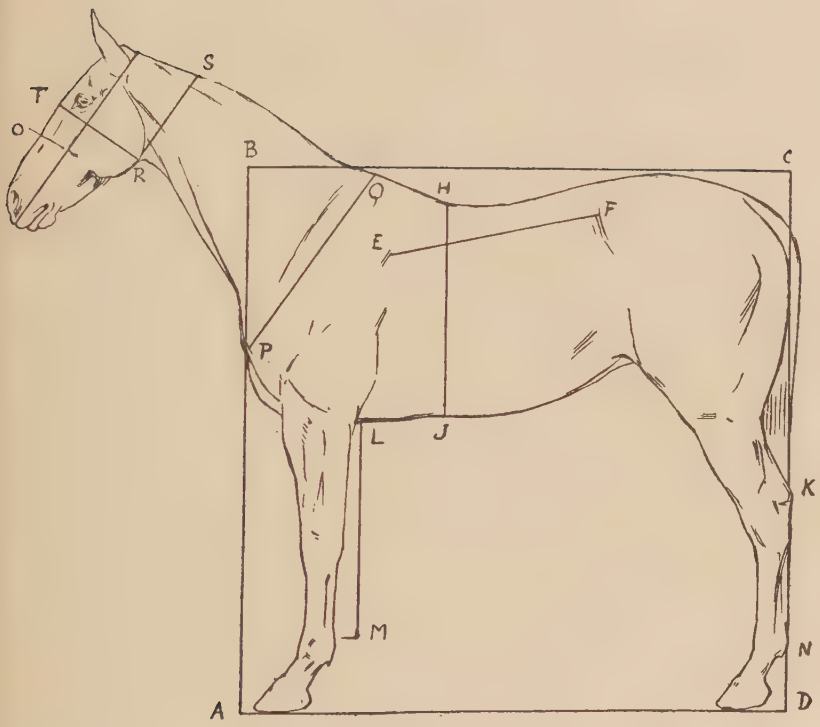


FIG. 1.

PROPORTIONS OF THE HEAD

As regards the head itself the following measurements may be noticed. Point O, the end of the zygomatic ridge, or cheek-bone, is rather more than half way down the head—the middle of the eye is about one-third of the way down the head,—in a colt lower. The greatest thickness of the head at TR is equal to a little more than half the total length of the head, and a line drawn through the neck at R at right angles, will often equal TR. In the front view of the head the greatest breadth of the skull is equal to one-half of the distance from the top of the skull to the top of the nostrils. Of course these measurements must not be accepted as infallible, but only as a guide to the general proportions of the horse. An hour or two might be advantageously spent in measuring up a few good photographs with a pair of compasses or dividers, and noting how the measurements vary. The student will, by this means accustom himself to the proportions of the animal under consideration and learn by degrees what to look for when he is confronted by the living model. It is interesting to observe how these measurements hold good when applied either to a thoroughbred or a heavy cart horse. The measurement LM is the one that shows the greatest divergence from the rule. In the thoroughbred the head reaches from L only to the top of the fetlock. In the cart horse it sometimes, though not usually, reaches to the ground. The neck of the latter is generally

decidedly shorter in proportion to the rest of the body than in the case of the racer. The measurement through H-J too, is naturally subject to variation in individual animals from time to time. A hunter that has been at grass for some while will have a much fuller appearance than when he is in hard condition. When the student has mastered the proportions of the horse by the means which I have indicated, he would be well advised to turn his attention to the artistic anatomy. Much valuable information may be gained from the books dealing extensively with this subject, but it would be a great advantage to the serious student to make a few careful drawings and measurements of the bones from nature, as even the best drawings in the anatomy books fail to convey the full impression of the form of the various bones to those who are not already to some extent familiar with them.

Learn the bones so that you are able to draw them tolerably well in any position from memory, paying particular attention to those portions which are subcutaneous (that is, immediately under the skin) or only covered by a thin muscle, as these portions greatly influence the surface form. The study of the artistic anatomy of a horse should not present any great difficulty to those who have some knowledge of the construction of the human figure, as all Mammals conform, broadly speaking, to the same general construction of the skeleton, subject to modification and limitations according to the animal's relationship

KEY TO SKELETON OF HORSE

1. Parietal Bone.
2. Coronoid Process of Lower Jaw.
3. Frontal Bone.
4. Zygomatic Ridge.
5. Comma Cartilage.
6. Angle of Lower Jaw.
7. Spine of the Scapula.
8. Scapula.
9. Coracoid Process.
10. Convexity of External Trochanter.
11. External Trochanter of Humerus.
12. Deltoid Tubercile.
13. External Condyle of Humerus.
14. External Tuberosity of Radius.
15. Carpus.
16. Metacarpus, or Canon Bone.
17. First Phalangeal or Long Pastern.
18. Second Phalangeal or Short Pastern.
19. Os Pedis.
20. Internal Condyle of Radius.
21. Ulna.
22. Second Phalangeal.
23. First Phalangeal.
24. Metatarsus.
25. Tarsus.
26. Os Calcis.
27. Tibia.
28. Head of Fibula.
29. External Condyle of Femur.
30. Patella.
31. Femur.
32. Tuberosity of Ischium.
33. Sacrum.
34. Superior Post Iliac Crest.
35. Superior Anterior Iliac Crest.
36. Angle of Scapula.
37. Cartilage of Prolongation.
38. Axis.
39. Atlas.
40. External Auditory Hiatus.

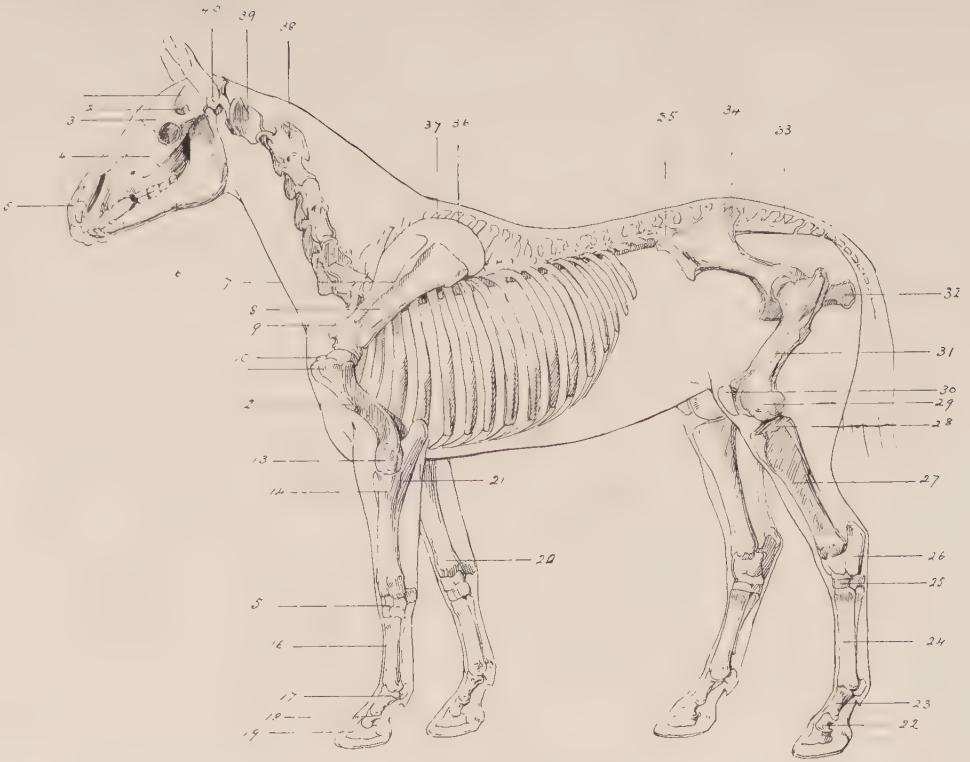


PLATE I.

[To face page 6.

to man. That is to say the further down the scale of animal life we go, the greater the anatomical difference between the human and the animal in question, we shall expect to find. Take the collar bone (or clavicle) for example. The difference between this bone in the human and the monkey, from an artist's point of view, is negligible. In the tiger the clavicle has almost ceased to exist, in the hoofed animals it is entirely absent. In the bones of the fore limb it is interesting and instructive to observe how this modification has taken place. The human being, in common with the Anthropoid or manlike apes, has his scapula, or shoulder blade placed in the back of the bony cavity formed by the ribs (Thorax). The lower apes and monkeys carry them on the side of the ribs, like a dog or cat. The horse, cow, sheep and all hoofed animals have their scapulas similarly situated, but their form is distinctly cruder, the acromium process being missing. The bone of the upper arm or humerus becomes shorter in the lower animals as a rule, while in the hoofed animals this feature is very marked, the humerus being shorter than the scapula.

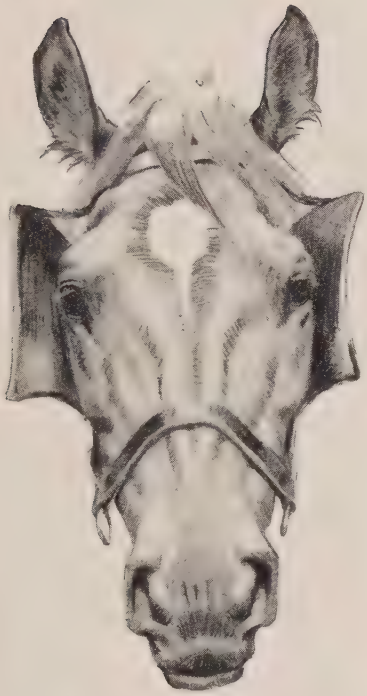
The junction of the scapula and humerus forms the shoulder joint. The human and the monkey are able to rotate the humerus in its socket in any direction. Cats and dogs are able to do so in a much lesser degree. Hoofed animals are confined almost solely to a backward and forward motion. The reason for this incapacity

will become apparent at once to anyone who takes the trouble to examine the construction of the skeleton. The absence of both collar bone and acromium process in the hoofed animals has so modified the shoulder joint, as practically to do away with the socket into which the humerus fits, and any lateral movement would have a tendency to dislocate the shoulder. There are two bones (the ulna and radius) in the forearm of the man, monkey, dog and cat. In the cow and horse these two bones are present, but are welded together, and are incapable of separate action, forming to all intents and purposes one bone.

The radius articulates below with the upper of two transverse rows of small bones forming the wrist or carpus ; beyond these, we have in man and in monkeys, as well as in certain other groups of animals, five elongated bones, termed metacarpals, four of which form the bony structure of the hand and are succeeded by the three phalangeal bones of the fingers or digits. The thumb, however, has only two of the phalangeals.

In the cat and dog the thumb is only present in a very modified form.

In the horse and cow the metacarpal bones are represented by only three bones, the centre of which is the longest and strongest ; the two smaller ones on each side of it commonly known as the splint bones, do not support the animal but serve as attachments for muscles. The heads of the three bones are of importance to artists,



HORSE'S HEAD.

[*To face page* 8.

as they give form to the joint. The first phalangeal bones are replaced in the horse by one bone only, the "Long Pastern." The second and third phalangeals are similarly modified. Thus we see the reduction in the number of fingers or digits from five in the human to one in the horse. In the cow and cloven hoofed animals the phalangeals appear in pairs. The hind leg may be similarly briefly compared.

BONES OF HIND LIMB

The expanding wings of the Pelvetic girdle, or hip bones, which are common both to man and to Anthropoid apes, are replaced in the lower types of ape and monkey by a much simpler structure which again undergoes considerable modification in the cat and dog families. The spreading fanlike bones of the human hip, are here represented by a pair of long narrow bones, set obliquely on either side of the back-bone. In the hoofed animals the pelvis undergoes a great change in form, the greatest difference between it and that of the above mentioned animals being the concave, downward, and inward curve, between the superior, anterior, illiac crest, and the posterior illiac crest. I cite only one important difference, as an exhaustive treatise on comparative Anatomy is outside the scope of this book, and the reader who is desirous of a fuller understanding of this subject must consult other works. Our notice of other parts of the skeleton must be equally concise.

The femur, or thigh bone, corresponds to the humerus of the arm, and is longer in man, than in the lower animals. It is much shorter in relation to their sizes, in the cat and dog families.

The lower leg of the human has two bones, the larger of which, the tibia, corresponds to the ulna of the fore limb, while the smaller outside bone, the fibula, answers to the radius. Modifications in animals, somewhat similar to those that have been pointed out as taking place in the fore limb, also occur in the hind limb.

The ankle (tarsus) of the hind limb corresponds to the carpus of the fore limb, the bone of the heel corresponding to the portion of the horse generally known as the hock. The remarks concerning the metacarpals and the extremity of the fore limb apply equally to the hind limb. The above remarks on the bony structure of the skeleton of man and various other animals are not, of course, in any way exhaustive, and are merely inserted here in order to give the student some assistance as to the method of approaching the study of the anatomy of animals.

STUDY OF MUSCLES

When the student has thoroughly familiarised himself with the skeleton of the horse, a course of study of the muscles, their form, location, attachments, and functions will be of great service in enabling him more readily to understand and appreciate the construction of the animal.

It may be found helpful, both for testing the

HORSES' HEADS.

[*To face page* 10.

student's knowledge and for acquiring further information, to make a series of anatomical drawings from good photographs or casts of horses in different positions, endeavouring to identify and outline the form of the various muscles and observing at the same time how certain actions bring into prominence certain muscles, or groups of muscles. It is surprising, if these researches are carried out observantly and conscientiously, with the assistance of a good Anatomy book to elucidate any difficulty that may present itself, what an understanding of the form may be acquired by this means, especially if, at the same time, an effort is made to memorise the various forms encountered.

Let us assume that the student has now, by the means laid down above, obtained some knowledge of the proportions and construction of the horse.

DRAWING FROM LIFE

At this stage of his advancement, provided he has acquired a reasonable efficiency in the handling of his material, he may now legitimately proceed to study from the living model, and this he will do fortified by the confidence derived from thorough knowledge of the construction and mechanism of the animal in front of him.

THE HEAD

The beginner making his first attempt to draw a horse from nature should, if he intends using

pencil, work on a sheet of smooth paper, certainly not less than fourteen inches by ten. He can take with him a selection of several sheets, and have them pinned on a drawing board; or better still, in a sketching portfolio, as supplied by most artists' colourmen. This method will for several reasons be found more satisfactory than a sketch book; for one thing, sketch books as large as this are very expensive—also the drawings in them are apt to smudge.

Fig. 2.

Select for your first model as quiet an animal as possible. Have it held or tied up, the former for preference, though even then you will find that the constant small movements are sufficiently disconcerting to anyone who has been accustomed to the luxury of drawing the human being.

Do not attempt to draw the whole animal at this stage; restrain your impatience, and be content for the time being to make drawings of separate parts. Keep two or three drawings of the same portion of the animal going on the same sheet of paper, so that when your model moves, you will have a drawing of the new position ready to continue with, and your time will not be wasted.

Let us start by considering the head. This is the most interesting and expressive part of the animal, and also one of the simplest to draw, since no portion of it (if we except the ears) is capable of much individual movement — a remark which certainly does not apply to the limbs or the neck. Furthermore the head consists largely of the bony framework, the skull being but sparsely covered by thin muscles in places, or, as in the front view, by skin only, so that the student who understands the substructure thoroughly is well on his way to drawing the head.

Fig. 3.

First let it be observed that the skull of the horse in common with other mammals comprises two portions—the skull proper, which contains the brain, and the lower jaw. It will be sufficient to mention, in addition that the hinder part of the skull is known as the Occiput, and that the pair of bones roofing over the cavity of the nose are known as the Nasals, while those behind them forming the region of the forehead are termed Frontals. A knowledge of the articula-

tion, or junctions, of the jaw bone with the skull proper is of great consequence to the artist.

There are two processes on the upper portion of the lower jaw where it joins the head proper, one of these processes has a small socket prepared for it immediately below the base of the ear; the other process passes into the Supra-orbital-cavity (the hollow over the eye) where its presence makes itself apparent when the lower jaw is in motion, as in eating.

Fig. 4.

A horse's head may be said to be made up of six distinct main planes—one anterior plane, two side planes, two oblique planes, and one posterior plane.

The anterior plane, composed of the Frontal and Nasal bones, presents a somewhat coffin-like appearance. It reaches its maximum width at the two bony ridges above the eyes, decreasing in width as it descends until it terminates almost in a point between the two nostrils. The cheeks and sides of the lower jaw and those portions of the face above and behind the nostrils, comprise

the two side planes, which are at right angles to the frontal plane. The two oblique planes are so situated below the eye, and between the nasal bone and cheek bones as to unite the frontal and side planes.

The Posterior plane consists of the inferior surfaces of the jawbone. The marginal sketch of a section taken through the head, two inches below the eyes at right angles to the frontal bones, will serve to give a clearer understanding of these planes. A study and comprehension of sections taken through larger and more important masses would enable the student to understand a form as a solid.

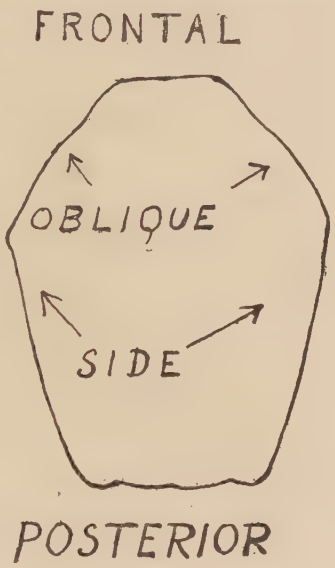


FIG. 5.

A bridle is of great assistance to an inexperienced student making his early essays to draw the head of a horse, as if he succeeds in accurately placing and constructing the blinkers and straps, the other portions will fall easily and naturally into their correct positions.

DETAILS OF THE HEAD AND EAR

Now let us examine the details of the head, beginning with the ear.

Difficulty is often experienced in drawing the

ears, there being a tendency to place them too high up on the head and too close together. The ears are set at a point immediately above the termination of the curve of the jaw bone, and upon this point, they rotate forwards, outwards and backwards. A sound knowledge of the construction of the ear can best be obtained by studying their formation from the animal for yourself remembering always that however much they may be turned in any direction their actual form can never be changed.

The total length of an average ear is equal to the distance from the top of the head to the middle of the eye.

THE EYE

As already mentioned the orbits, or sockets, of the eye are situated one-third of the way down the head ; they lie in an oblique plane, and into them, and slightly protruding from them, the eyeballs and eyelids are placed. It should be noted that the eyes of a horse are oval, not, as so often represented, round, or spherical. This mistake is frequently evident in old fashioned prints. Perhaps, however, the most frequent error committed in connection with the eye by many inexperienced painters, when representing a head in profile, is to place the eye at right angles to the frontal bone ; whereas examination of your model will reveal the fact that the eye is set into the socket obliquely, and that when the head is in a vertical position, the lachrymal gland, or tear

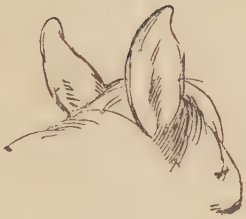


FIG. 6. FIG. 7. FIG. 8.

FIG. 11.

FIG. 10. FIG. 9.

duct, is lower than the corner nearest the cheek bone. Due regard should be paid to the size of the eye, which is relatively small in the heavy types of horse and larger in proportion in the thoroughbred.

The upper eyelid of a horse in normal circumstances covers about one-fifth of the eye, and is furnished at its inferior border with thick eyelashes, which serve to protect the eye. These eyelashes cast a decided shadow, eliminating in almost every instance the fictitious high light so often introduced into the eye in horse portraits. Observe carefully, and you will notice that when not in action, the average horse has the eye semi-closed and tranquil looking. It is only when the animal is excited or frightened, with the head thrown up, that the eye is likely to catch a bright reflected light.

FIG. 12.

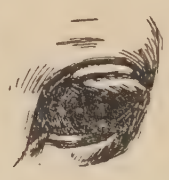


FIG. 13.

SUPRA ORBITAL CAVITY

The Supra Orbital Cavities, previously referred to, are the deep hollows situated immediately above the eyes, bounded on the inner side by the curved surface of the parietal bone, and on the outer edge by the zygomatic arch. These hollows are always apparent in the horse, but become much more accentuated in old age, when

the movements of the process of the lower jaw within, are very noticeable.

NOSTRILS

The nostrils are the exits of the air passages, which directly communicate with the lungs. These undergo considerable expansion when dilated, becoming more circular to accelerate respiration. They are located on either side of the extremities of the nasal bones, and lie in two planes which face outwards and downwards. Each nostril is composed of two distinct parts, "the wing of the nostril" and the "comma cartilage." This pair of cartilages is attached to the nasal bone, and takes the form of two inverted commas, placed back to back, as in the Fig. 15. If the form of these cartilages were better understood by students, they would experience less difficulty in accurately constructing a horse's nose.

FIG. 14.

FIG. 15.

CHEEK

The cheek is composed of the largest muscle of the head, the Masseter, and occupies a great portion of the side view of the head. It is limited above by the zygomatic ridge and arch, and posteriorly it is terminated by the curve of the lower jaw.

THE MOUTH

The mouth varies greatly in shape and size according to the age of the animal. In the colt the mouth is so small that in the side view of the head, the upper corner scarcely extends beyond the wing of the nostrils. In an old horse, or one whose mouth has continually been distorted by rough handling, the length of the mouth is considerably greater. The relaxation of the lips, more especially the inferior, indicates age. It is not necessary to give a detailed description of the formation of the teeth, and it will suffice to mention that the older the horse is the more prominent his incisor teeth will be.

COLT'S HEAD

A colt's head, compared briefly with that of the adult, is characterised by the receding forehead, rounded frontal bones, and large ears, the latter being especially marked in the cart colt. The eyes which are rather large in proportion, are placed lower in the head while the hollow above the eye is much less evident in the colt. The distance from the eye to the lower end

of the zygomatic ridge is less in the foal. The nostrils smaller and closer to the lip—mouth much smaller—jaw bone less developed. The head in profile of the young animal has at first sight an oval appearance compared to the triangular character of the adult. In the front view the head of colt tapers towards the lower end in a more marked degree than in the full grown animal. This is largely accounted for by the fact that there is less space required at this stage of his development for the teeth.

Fig. 16.

In starting to draw the head from nature it will be found helpful in the initial stages to draw a straight line down your paper corresponding to the line that runs down the centre of the frontal and nasal bones of your model, inclining the line at the angle at which you wish to draw the head. Get your large proportions blocked in as quickly as possible, paying due heed to the main planes previously alluded to and ignoring at this stage all minor details. When you have done this, subject your drawing to a thorough and searching criticism, testing its accuracy with a few measure-

ments made from your model. Do not in your eagerness to complete your drawing forget all the elementary knowledge that you have acquired from the study of simpler objects. Remember that the horse's head is a symmetrical object, composed mainly of pairs of features, prominences and depressions.

Fig. 17.

Draw each of these in relation to each other and in relation to the centre line. No matter how well an individual part may be drawn, if it is not truly placed in relation to the whole it is valueless. A little care now may save you a lot of trouble later, for it is easier to make any alterations that are required in the initial stages of a drawing, before you have a lot of detail to cope with. Nothing is more annoying than to have carried a drawing to a stage nearing completion, only to discover that it is out of proportion and should be made longer or broader, as the case

may be, and in order to rectify your error you will be compelled to rub out a large portion of your carefully drawn detail.

Do not neglect your elementary linear perspective-horizontal straight lines above the level of the spectator's eye, as they recede from him, vanish downwards, and conversely those below the level of the eye vanish upwards; and the two, if parallel, will, if produced indefinitely, meet at the same vanishing point, that point being on a level with the spectator's eye.

If you draw straight lines across the various pairs of prominences and depressions mentioned above, in a dead front view, these lines would cross the centre lines at right angles. In a perspective view—say a three-quarter front view with the head slightly raised—this will no longer be the case: but your drawing will, if accurately constructed, convey the impression that they are right angles, in perspective, and you will then observe that the distance between the far eye and the far nostril is fractionally shorter than the distance between the near eye and the near nostril.

Attention must be paid to the fore-shortening. As the head is raised the amount seen of the under surface of the lips and muzzle is increased, all the frontal planes being proportionally decreased, and the view obtained is similar to what we should see if we were sitting almost underneath. Perhaps the part most noticeably affected is the forehead, which is already in a slightly receding plane, and the lifting of the head causes the distance above

the eyes to diminish very rapidly. In the foreshortened view the student will find the bridle of great assistance, the nose and brow bands not only being a guide, to the sections of the parts they cover, but also helping him to recognise more easily how much the distance between these parts has been diminished by the raising of the head.

When the head is held vertically, the nose band, if on a level of the spectator's eye, will appear horizontal: but when the head is raised it will assume an arched appearance. The same remark, of course, applies in a lesser degree to the brow band.

Endeavour to make yourself familiar with the head from at least four points of view—the front, three-quarters front, side, and three-quarter back view.

The front part of the head is practically the skull, plus ears, eyes, nostrils and lips. Treat your subject in the same way as you would any elementary symmetrical object; draw a vertical straight line down your paper, and measure the greatest breadth across, just above the eyes, into the total length. You will find that this will be equal to about half the distance between the top of the head and the middle of the nostrils. The next broadest measurement is across the cheeks: whilst the narrowest point will be above the corners of the mouth. When you have these points correctly placed you can proceed to block in the nostrils, and indicate the distance between

the ears. Do not make this too great, but remember the construction of the skull. Let your drawing reflect the main planes presented to you, and be sure to place the eyes on the lateral planes, not on the frontal planes, as is sometimes done by the uninitiated. Keep your drawing balanced and symmetrical by measuring from the centre line to any marked cavity or convexity on the one side and comparing this measurement with the corresponding point on the other side. The description of the various subsidiary planes of the face would make tedious reading and would probably fail to convey as much useful knowledge as the student may gain for himself by an intelligent study of the model. Just one point, however; mark the subtle transition of the frontal plane to the oblique plane on a level with the eye.

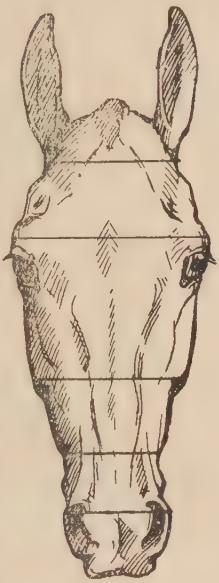


FIG. 18.

The three-quarter front view has already to some extent been dealt with, and we will pass to the study of the side view.

In this aspect your first consideration will be the relative proportion of the greatest breadth through the jaw bone to the forehead, as compared with the total length of the head. You will duly note how the jaw bone, at the articulation, would, if produced to meet the forehead, make a right angle with it, and how the line of the forehead

and nasal bones composes with the line of the jaw and chin. It is by no means an uncommon error amongst youthful draftsmen to represent these lines as converging too rapidly, thereby leaving insufficient room for the animal's teeth.

Fig. 19.

In the three-quarter back view, the first thing that arrests our attention is the prominent position of the eye and surrounding bony structure, and the same thing to some extent applies to the nostril. This is by no means an easy view to draw. Care should be taken from the outset to avoid working two views of the animal into one drawing. This is a pitfall that is always waiting for the unwary student of the moving model, and from this particular point of view it is easy to fall into the trap, as the outline down the front of the head will be influenced by the slightest movement. A small turn of the face in your direction, and the front outline, below the eye, will be formed by the near edge of the frontal and nasal bones. A slight turn away from you, and this outline will be given by the cheek bone, the fullness of the muscle over

the teeth, and the prominence above and behind the nostril. You may help yourself by finding out where the centre line down the front of the face would fall, even although you cannot see it, as it lies on the plane inclined away from you when it is located, it will be a guide to you to know that the cheek bone will be parallel to it, and that the under surfaces of the jaw bone converge as they descend at an angle to it.

Fig. 20.

In whatever position you draw the head, it is advisable to leave the ears until the last, as they may be regarded as accessories having no bearing on the construction of the main form. For the purpose of elementary study, try to place your model so that the lighting will be as simple as possible, and the large planes readily distinguished.

Do not be disheartened if your first results are not entirely satisfactory ; if your efforts have been sincere and well directed, you have certainly gained by experience some knowledge that will be of service to you in your future attempts. A portrait painter, who had considerable experience in teaching, once told a student that he

could not reasonably hope to achieve any degree of success with the human head until he had painted at least a hundred.

THE NECK

Now let us turn our attention to the neck. The student who has studied his anatomy will recall that the bony structure of the neck consists of seven vertebrae. The first and second of these bones, the atlas and the axis, are of structural importance to the draughtsman inasmuch as they materially affect the surface form of the animal. The atlas carries two large transverse processes, protruding laterally on either side of the neck, which are always in evidence immediately behind the root of the ear, in whatever direction the head may be turned, and never alter their position in regard to it. Also it is largely due to these processes that the neck, as it approaches its junction with the head, is thicker through the top than it is underneath. At its junction with the body the reverse is the case, the neck being narrow at the top where it joins the withers, and thick below where it joins the chest and shoulders. Try to visualise the sections of the neck at the two extremities.

The spinous process of the axis (or second cervical vertebrae) projects in an upward direction and influences the external form only when the neck is arched. In this position when viewed from the side, you will notice that the upper boundary of the neck that lies between this process and the

HORSES' AND COLTS' HEADS.

[*To face page* 28.

base of the skull can be represented by a straight line, no matter how curved the rest of the neck may be.

The strong ligament (ligamentum nuchae) that stretches from these spinous processes of the dorsal vertebrae (which form the withers) to the base of the skull, plays an important part in assisting the cervical vertebrae to support the weight of the head; it is of interest to the artist not so much on account of its influence on the external contours, but from the fact that once its presence is recognised it is possible to indicate it by a straight line; and the superstructure of muscles, and the fatty tissues of the crest surmounting the ligament can be added after it is located.

It may be noted here that the muscles which form the superior border of the neck do not extend further forward than the base of the skull, and that no action of the neck can effect the outline anywhere in front of this point. The surface forms of the neck vary much according to its position. In the side view when the head is turned towards the spectator, there is a decided tendency for the well-marked depression below the large muscles which attach to the wings of the axis to become much more emphasised; the deeper muscles which attach to the other cervical vertebrae are also brought into more prominence by this movement. When the head is lowered, as in eating, the superior border of the neck tends to become distinctly more flattened than when the head is

KEY TO ANATOMICAL TERMS

1. Mastoids-Humeralis.
2. Splenious.
3. Ligamentum Nuchae.
4. The Crest.
5. Spine of Scapula.
6. Angle of Scapula.
7. Iliac Crest, or Pin-bone.
8. Tensor Vaginae Femoris.
9. Middle Gluteus.
10. Gluteus Maximus.
11. Vastus Externus.
12. Semitendinosus.
13. Biceps Femoris.
14. Gastrocnemius.
15. Tendo Achillis.
16. Os Calcis.
17. External Lateral Ligament.
18. External Malleolus.
19. Extensor Pedis.
20. Crest of Tibia.
21. Portion of Head of Tibia.
22. Oleocranon Process of Ulna.
23. Flexor Carpi Externus.
24. } Lower extremities of
25. } Radius.
26. Internal Condyle of Radius
27. Extensor Longus Pedis.
28. External Tuberosity of Radius.
29. Extensor Longus Pedis.
30. External Condyle of Humerus.
31. Short Head of Triceps.
32. Biceps.
33. Large Pectoral.
34. Long Hair of Triceps.
35. Trochanter of Humerus (forming the point of the shoulder).
36. Two branches of Deltoid.
37. Carotid Artery.

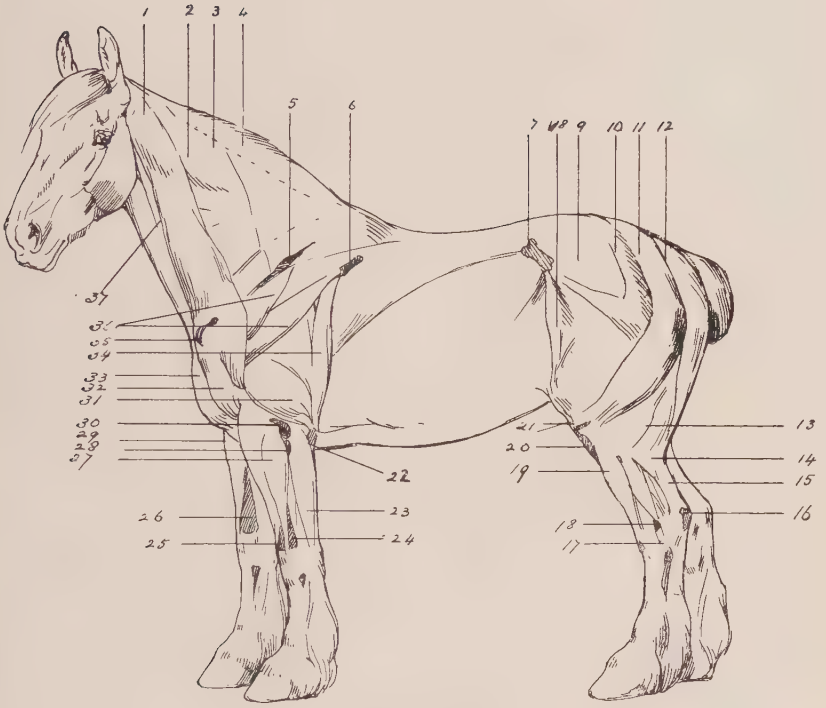


PLATE II.

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carried in a horizontal position : this being more marked at the centre of the neck and where it approaches its junction with the withers. This change can best be observed in a three-quarter front view, when the mane will appear to grow from a ridge that divides an almost flat surface. The throat, too, is affected by the lowering of the head. It appears to have become thicker, due to the fact that the muscles of the throat and tongue hitherto concealed by the bones of the lower jaw, (in the intermaxilliary space) are now to some extent pulled out of their normal position. The reader is warned that undue emphasis of the feature may give rise to an unnatural form—a form which is by no means uncommon and is associated with the diseased enlargement of the glands.

The connection of the inferior border of the neck with the body deserves some attention. The group of long thin muscles, which, together with the wind pipe (trachea) and jugular vein, go to make up the somewhat cylindrical structure that forms the inferior boundary of the neck, attaches to the head of the breast bone (sternum) which is situated a few inches lower down the chest than the points of the shoulders, and midway between them. When the animal is grazing the impression is conveyed that this connection with the chest takes place lower down than is actually the case. This is due partly to the fact that the neck as it stretches downward and forward conceals its true attachment, and partly owing to

the loose skin that covers this region. This loose skin sometimes, in this position wrinkles into well marked corrugation, which pass across the chest under the neck. In many instances the combined measurements of the lengths of the head and neck appear at first sight to be insufficient to permit the animal to reach the ground, and as a matter of fact, such would indeed be the case if it were not for the elasticity of the muscles of the neck; also it must be remembered that the cervical vertebrae, when the neck is at rest (i.e. carried in horizontal position or only slightly raised), form a well marked curve that is straightened out when the neck is stretched. Furthermore the pivot from which the bones of the neck operate is situated sufficiently low down the body to facilitate feeding from the ground. In the case of horses with extremely short necks it is sometimes found necessary to feed them from a rack or manger, as the amount of nourishment they would obtain if left to forage for themselves would be insufficient to sustain them.

The reader will no doubt have noticed with what difficulty a young colt feeds from the ground. Handicapped by his short neck and long legs, he is not only obliged, like his parents, to take a stride forward with one of his forelegs, but is not infrequently compelled, in order to get the forepart of his body a trifle nearer the ground, to feed with the knee and fetlock of the advanced leg bent, while the other foreleg is forced back under him at an acute and very awkward angle.

FORE LIMB

When studying the fore limb the student should not lose sight of the fact that the shoulder blade (scapula) and the bone of the upper arm (humerus), though confined close to the body by a covering of numerous large muscles, are just as much part of the fore limb as that portion which we are accustomed to refer to as the leg, and that no movement of the leg can take place without affecting the position of these bones and the muscles attached to them. For example—when the knee is raised, as in the action of a high stepping hackney, the humerus will become more vertical and the point of the shoulder will be forced upward, while the angle of the scapula will in turn be correspondingly depressed.

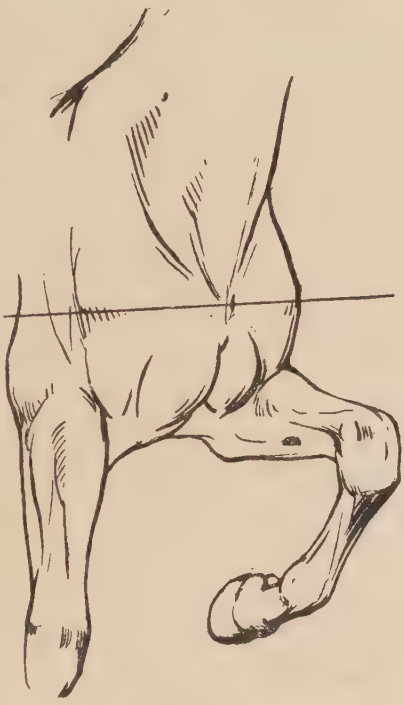

FIG. 21.

The subject of action will receive more attention later.

FORE LIMB IN PROFILE

Now let us consider the fore limb in profile. The scapula (and the group of muscles superimposed on it) slopes from the withers forward, downward, and outward to the point of the shoulder. It is in an oblique plane, its anterior border being inclined inward towards the neck. This plane can be best understood by studying the front and side view in conjunction. The top edge of the cartilage or prolongation of the scapula, should be looked for an inch or two below the top of the withers (formed by the extremities of the spinous process of the dorsal vertebrae). The spine of the scapula, especially the tuberosity, is plainly discerned in every horse, and in a thin model it is extremely prominent about a third of the way down the scapula.

When the animal is in a natural standing position, the angle of the scapula can easily be located and forms a useful landmark, as a straight line dropped vertically from it will pass through the elbow (olecranon process). It may be a help to regard this line as forming the long side of a triangle made by the angle of the scapula, the elbow and the point of the shoulder, the measurement between the angle of the scapula and the elbow, of course, varying in action. When the humerus is extended (that is, with the lower end moved forward) the distance will naturally become greater, but when flexed (that is bent backward) the angle between it and the scapula

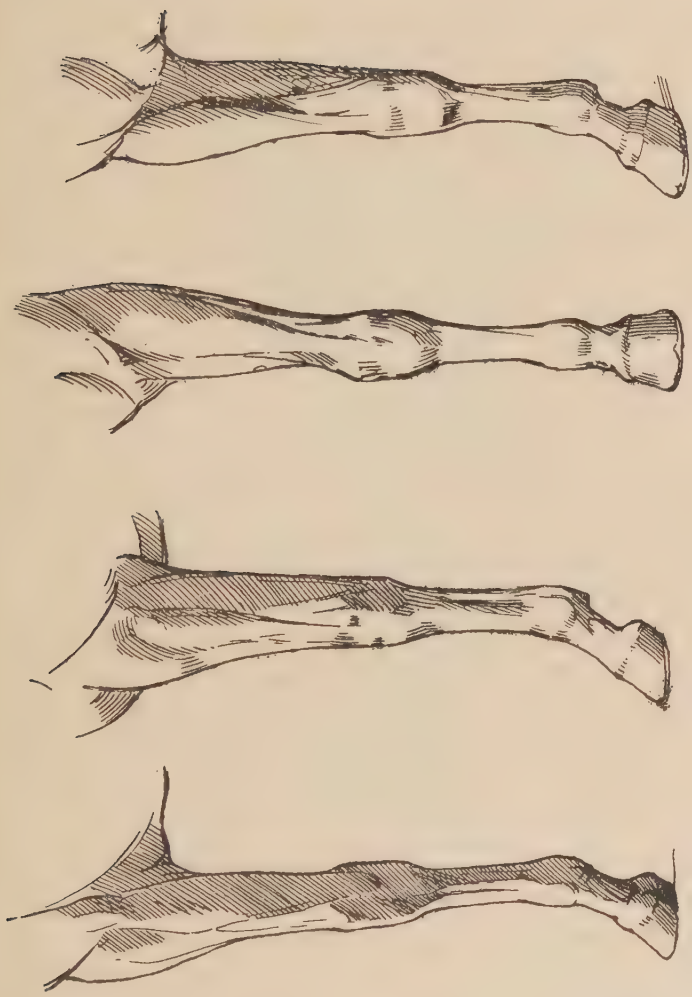

FIG. 22.

FIG. 23.

FIG. 24.

FIG. 25.

will become less, and the measurement correspondingly decreased. It will be found a guide to locate on the humerus at an early stage the lower end of the deltoid tubercile, as several important forms converge to this point. It is situated about half way down the external side of the humerus. The deltoid descends to it from above, while the large extensor of the knee which forms the anterior border of the forearm passes to its origin in that direction between the biceps in front and under the decided prominence, caused by the short head of the triceps, at the side. When looking at the forearm of a horse we cannot help being struck by its simplicity, compared with that of the human being. As previously pointed out the ulna bone is, in the horse, a rudimentary and incomplete form, firmly welded on to the posterior surface of the radius ; thus there can be no action of supination or pronation, and consequently the muscles required by man for these movements are absent in a horse ; further, the human having five fingers requires more flexor and extensor muscles to operate them than does the horse with only one digit. When examining the leg in profile, notice that the forearm may be roughly divided into two portions, the front half being formed by the extensor muscles, and the rear half by the flexors.

It will be noticed that while the elbow shows on a level with the inferior border of the body formed by the chest bone or sternum, the anterior border of the forearm shows several inches

SHOULDER AND NEAR FORE LIMB.

[*To face page* 36.

further up. If we trace this line of the front of the leg down from the point where it is first seen emerging from under the short head of the triceps, we notice first, the fullness of the large extensor of the knee (extensor carpi radialis) on a level with the elbow, the forearm here reaching its maximum width. This fullness rapidly diminishes as the muscle descends until about two-thirds of the way down the forearm it emerges into a strong tendon that proceeds in an almost unbroken line to its insertion on the head of the canon bone (metacarpal) thus giving the forearm an appearance of tapering from above downwards.

The posterior boundary of this portion of the limb can almost in this view, be represented by a straight line between the elbow and the small bone (pisiform) that shows so prominently at the back of the carpus. It is desirable when drawing the legs of an animal to keep the two sides of the limb going at the same time as much as possible. That is to say, do not proceed to draw too much of either border of the limb without indicating where the other border is coming. The leg may be moved at any moment, and it is more important to have succeeded in accurately placing in relation to each other the lines which form the two boundaries of the limb, than to have made a detailed delineation of a long piece of one boundary only.

When the knee (carpus) is raised as in a gallop, or in the action of a high-stepping hackney, the

muscles on the anterior border of the fore-arm are brought into prominence, particularly the above-mentioned extensor carpi radialis; the fleshy part of this muscle bunches so as to form a convex mass, and the transition into the tendon is more abruptly accentuated than when the limb is in repose. It is not unusual for animal painters, when representing the limb in this position, to have it held up for them to study. This practice though undoubtedly helpful in enabling the artist to study the light and shade, etc., in a position that the horse would not be able to maintain unaided, should be indulged in with caution, as the muscles of a limb so supported will always be flaccid and inert in marked contrast to the muscles of the self-supported limb of a horse in action, which will always appear full and tense. The bones of the forearm are apparent in several places beneath the surfaces of the

FIG. 26.

skin. The external condyle of the humerus causes two prominences, which can generally be identified just below the inferior margin of the short head of the triceps, while immediately below is seen the elevation formed by the head of the radius, to which the large extensor of the foot attaches (extensor longus pedis). The olecranon process, or elbow, is also but thinly covered, and when the joint is flexed forms an outstanding angular prominence. The lower third of the external border of the radius is subcutaneous. Its lower extremity forming one of the most important landmarks of the leg, falling as it does midway between the top of the elbow and the bottom of the fetlock joint.

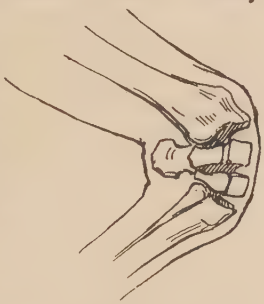

FIG. 27.

On the inner side of the forearm is a small horny mass that varies in size according to the breed, being usually small in well-bred horses and larger in commoner sorts.

The knee (carpus) looked at from the side has the anterior boundary almost straight or only slightly convex ; behind, it is very angular owing to the presence of the projecting pisiform bone. (This bone is referred to as the trapizium by some anatomists.) When this joint is flexed the two layers of small bones which form the carpus tend to open in the front, and impart a more convex curve to the anterior margin, as shown in the accompanying diagram. The lower portion

of the fore limb, variously referred to as the shank or canon, vertically prolongs the forearm and terminates at the fetlock joint. Below the knee there are no muscles worth mentioning, the surface forms being affected only by bones, tendons, and ligaments. In profile the canon bone (metacarpal) descends vertically from the knee in an unbroken straight line, and posteriorly the strong tendon that is separated from the bone travels straight from below the prominence on the posterior surface of the knee to the back of fetlock joint. As it descends it has a tendency slightly to diverge from the canon bone, thus causing the measurement taken across the inferior extremity of the limb immediately above the fetlock somewhat to exceed a transverse measurement just below the knee.

The fetlock is that portion of the limb that unites the canon with the pastern. In profile it is wider than any portion of the shank. The pastern is the most slender part of the limb, sloping forward to make an angle of about 50 degrees or more with the canon bone in an Arab or thoroughbred, but more upright in the heavier types of horse. This angle should be carefully observed, as if it is overdone when the horse is standing naturally a weakness of the joint will be indicated. On the other hand an unduly upright pastern is often the outcome of overexertion. In actions, such as the canter or gallop, when the entire weight of the body is momentarily supported by the one limb, the pastern may be

forced into an almost horizontal position. As it approaches the hoof the pastern tends to increase somewhat in width. Crossing it obliquely from the side of the fetlock there can be seen in finely bred horses the suspensary ligament passing to its attachment with the tendon of the long extensor of the foot. It may be noted that the pastern is longer in a race horse than in a cart horse.

We will now turn to the fore limb of the adult when viewed from the anterior aspect, and as it is so intimately associated with the chest the two may be considered in conjunction. The Scapulas from this view incline from the withers forward and outward to the points of the shoulders formed by the trochanters of the Humeri; a measurement taken across the chest through these points, which are clearly defined through their thin covering of muscle, will give us the maximum width of the chest. This measurement is so variable in different types of horses that it would be useless to attempt to lay down a fixed rule for it, but it is advisable for the student, when drawing this view, to make his own careful tests in the initial stages of his drawing, comparing it with the length of the leg from the bottom of the hoof upward. It is helpful to observe, in the front view, that if a perpendicular line is drawn through the centre of the head of the humerus to the ground, that it will pass through the centre of the hoof, provided that the horse is standing normally. According to some authorities, the distance between the feet, when the legs are

vertical, is equal to the width of the hoof; but as the distance between the feet is so obviously dependent on the width of the chest and the size of the feet, this measurement is not likely to be of much assistance.

It may not be out of place to recall that the two sides of the chest are symmetrical, and that when drawing it the student may with advantage employ the same methods used as in constructing the head.

The Median line down the chest is formed by the junction of the inferior border of the neck with the body, a few inches lower down the chest than the points of the shoulders, and below we have the groove between the large pectoral muscles; on each side of this centre line we can balance the principal prominences equidistantly.

The recognition of the symmetry of the animal's body is a great aid to representing it, as it is always helpful to indicate important landmarks on animals in pairs, whether your model is foreshortened or otherwise.

The greatest width across the forepart of the horse (it cannot accurately be described as the chest as it is on the side plane) will be found through the fulnesses on the sides, caused by the short head of the triceps, immediately above the junction of the forearm with the body. The student of anatomy will readily identify the important forms of the biceps and deltoids showing through the thinner portions of the sterno-mastoid muscles.

FIG. 28.

FIG. 29.

With regard to the forearm, notice that the external border, where it emerges from under the triceps, has its beginning considerably higher up than the internal border.

In this view the widest part of the leg is on a level with the lowest part of the chest; from this point the line bordering the inner side of the leg falls nearly vertically, the outer border drawing in rapidly as it descends; the line forming the inner border is slightly broken as it approaches the knee by the radius crossing in front of the flexor muscles. The condyles of the radius are responsible for the two well marked prominences on the superior border of the knee, the internal condyle which is placed a trifle higher than the external being the more defined of the two. The knee from the front view, as in profile, is slightly wider across the centre, but shows a distinct tendency to diminish in width at its junction with the canon.

The transition from the knee to the canon is less abrupt than from the forearm to the knee, the fulnesses caused by the heads of the splint bones being smaller and less angular than those made by the condyles of the radius.

In a finely bred horse the details of the construction of the knee are plainly discernible under the skin.

The shaft of the canon is thin, symmetrical, and rounded, its surface being broken only by the strong tendon of the extensor of the foot, which is always in evidence when the foot is

extended—unless, of course, you are dealing with a type of horse that has hairy legs.

The fetlock has a more rounded appearance from the front than in profile, the sides of the joint being only slightly flattened.

Fig. 30.

Fig. 31.

The pastern is thinner at the top than at its junction with the coronet. It may be an assistance when drawing the coronet and hoof to remember that the top of the hoof bounded by the coronet, like the inferior margin bounded by the shoe, is nearly circular, but the upper circle lies in an oblique plane, high in front and depressed at the heel. Thus, when viewed from the front with your eye at a much higher level, the curve of the upper boundary line of the hoof may quite possibly appear as a straight line, and in any case will be only slightly curved.

The circle formed by the shoe you will, of course, represent as having the portion nearest to you on the ground the lowest on your paper.

Fig. 32.

It will be found a guide to draw not only the portion of the shoe that you can see, but also to indicate where those portions would come which

are obscured from you by the hoof. Do not forget the elementary rules of model drawing as applied to circles in perspective. It is very important to impart to the drawing of a hoof the appearance that it is firmly planted on the ground, as a badly constructed curve on the under margin of the hoof will convey an unstable appearance to the best drawn leg above it.

Fig. 33.

The small pastern continues the long pastern in the same direction, and influences the surface form very little in the side view. Its superior portion is surrounded by the prominence known as the coronet which borders the upper margin of the hoof. The lower extremity articulates with the coffin bone, situated in the centre of the hoof.

The angle made by the pastern with the canon bone is modified by the hoof; that is to say that if the line forming the anterior boundary of the pastern is produced downward it will project clear of the hoof. It will be observed that the hoof, which varies greatly in size according to the breed, is always at least twice as high in front as it is behind.

In heavy cart horses when the lower part of the fore limb is covered by an abundant growth of hair, the anatomical surface markings of the fetlock and pasterns are partially or entirely

obscured, but, nevertheless, care should be taken when drawing a limb of this type to be certain that the larger forms beneath the hair have been properly understood and acknowledged, as even if they are not marked very definitely, they make themselves felt and do to a great extent influence the lie of the hair.

Fig. 34.

In comparing the fore limb of the colt with that of the adult animal our attention is first arrested by the great length of the limb from the elbow to the hoof, the forearm, canon, and pastern being relatively longer in the young animal. Owing to this length of limb the table of proportions (Fig. 1) is not applicable to the colt, the measurement from the top of the withers to the ground far exceeding the total length of the animal, whereas, as it will be remembered, in the average adult these two measurements are approximately equal.

With regard to the shoulder blade, though proportionately slightly shorter than in the adult, the difference is not great, but is accentuated by the undeveloped withers of the foal. The younger the foal, the higher the superior border of the scapula extends, and the more obliquely it is set on. The humerus, alone of the bones of the fore limb, conforms to the proportions laid down for the full grown animal.

The growth of the bones is not uniform throughout, their extremities being larger proportionately at birth; this causes the joints of the colt to be much in evidence, the point of the shoulder being large and protuberant, and the knee long and prominent, its size being emphasised by the fineness of the canon bone immediately below; the fetlock is relatively large, the pastern long and thin, while the hoof is extremely small and upright.

The portion of the body sometimes referred to as the barrel, which connects the forehand with the hindquarters, is, broadly speaking, cylindrical in its general formation, with a tendency to decrease in bulk at its junction with the hindquarters. A vertical measurement taken from just behind the withers to the inferior margin of the barrel will be very much greater than a similar measurement taken immediately in front of the hip or pin bone. This narrowing of the barrel as it approaches the hindquarters is most apparent in finely bred types of animal, and is accounted for by the upward direction of the line that

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[*To face page* 48.

bounds the body inferiorly. In the heavy types of animal with full well-rounded barrels, this line appears to terminate at the stifle joint, the joint that is equivalent to the knee of the human; but in the race horse, and in many breeds of ponies, the stifle is very distinctly lower down than the stomach, thus giving to the hind limb a great freedom of action.

When drawing a horse in profile the student is advised to ascertain the exact level on which the line of the stomach meets the hind limb (in some instances it will be found to be on a level with the point of the shoulder). Another important point to look for on the barrel is the last or shortest rib; its position in regard to the hip bone should be noticed, as this measurement is subject to considerable variation in different models. In thin horses the last rib is always conspicuous, as it forms the anterior border of a well marked depression between it and the hip bone. In the back of a thin horse the spinous processes of the vertebrae are noticeable beneath the skin, often showing in a well marked ridge. In a muscular specimen, however, the backbone is embedded in a mass of muscles on either side. When drawing the barrel from a three-quarter front or three-quarter back view, be sure, if your model has harness on, to represent it as lying on and enclosing the body correctly, bearing in mind that when you are drawing the underside of a strap in contact with the animal, that you are actually giving form to the animal itself.

Try to imagine how vertical sections taken through various points of the body would appear ; notice where the greatest width through the horse is ; also how the ribs spring out from the spine in an almost horizontal direction ; observe where they curve, and the locality above and behind the elbow where they tend to be flattened.

We now come to the hind quarters and hind limb. The bones of the pelvis and sacrum previously briefly referred to are largely responsible for the general form of the hind quarters.

In thin models we are able to pick out easily the various most important landmarks, such as the highest part of the quarters, the hip bone, the head of the thigh bone, and the prominence of the buttocks formed by the bones of the ischium. The hind quarters of a horse are formed by several large, tolerably well-defined, planes, of which the student will readily get a mental grasp after a little study. First there is the large superior plane that extends from between the two hip bones backward to the tail. The sides of this plane are parallel to each other for about the first two-thirds until they reach the trochanter of the femur (or thigh bone) whence they converge rapidly towards the buttocks.

The side plane consists of a large flat vertical surface which is somewhat triangular in shape and forms the flat portion of the thigh. It lies between the hip bone and the trochanter of the femur, and the stifle joint. The anterior limits of this plane are clearly defined, but posteriorly it merges

subtly into a less well defined vertical plane which recedes toward the posterior plane, the latter being composed of the buttocks and the superficial muscles of the thigh which attach to the inner side of the limb.

A clearer comprehension of these planes will be gained from the study of a cast of a horse (which can conveniently be placed in any position), as it will enable the student to become acquainted with the appearance of the horse from points of view that are not readily obtained in the living model.

FIG. 35.

Fig. 35 is a diagram of the body of a horse (head and neck omitted), as seen from above shows the superior plane of the hind quarters; the parallel lines at the side demark the superior termination of the vertical side planes; the converging lines define the limits of the oblique, or receding planes; while the curved lines passing round the muscles which cover the ischium bones indicate the superior border of the posterior plane.

When drawing the hind quarters and leg in profile, it is desirable to start by getting the prominences caused by the pelvis and femur, referred to above, accurately placed in relation

to each other. The line from the highest part of the quarters to the tail should now become the object of your careful observation. In many horses, particularly thin ones, this point is very pronounced. When this is the case and the tail is set on low down, the quarters have an ugly appearance of falling away which is termed "goose rumped."

When the tail is placed high up the general appearance of the quarters will be straighter and there will be an appearance of increased length between the root of the tail and the buttocks.

When you have drawn this portion to your satisfaction, you have now to decide where you are going to place the stifle joint, seeing that its position will be affected by any movement of the leg. The stifle, in so far as its measurements concern the artist, has something in common with the elbow joint of the fore limb, as the flexion and extension of both the femur and the humerus modify the shape of the triangular, muscular plane above it. Further, while in the fore limb a long muscle (the long head of the triceps) connects the elbow with the angle of the scapula, in the hind limb the thin muscle (tensor vaginae femoris), which has its origin on the hip bone, plays a somewhat similar part. The student will find it well worth his while to try to gain some sound constructional knowledge of this joint, as it seems to be a stumbling block to many. When a horse is standing normally, with his hock no further back than the point of the buttock,

the knee cap (patella), if it does not actually lie back in a slight depression, certainly is not the most prominent point on the joint. The cushiony fulness that is so noticeable in this vicinity (the form of which rather suggests the patella) is caused by the large muscle (vastus internus) that folds down over the top of the patella to which it is attached by a strong tendon.

Fig. 36.

Fig. 37.

It is when the joint is flexed that the patella forms the outstanding prominence of the joint (as shewn in Fig. 37). Those of you who are acquainted with the drawing of the human knee will recognise the affinity between the two forms. A well developed vastus internus, in repose on a man's knee, forms a not very dissimilar fold over the patella to that which occurs on the horse.

Be particular in placing accurately the obtuse angle made by the junction of the line bordering the buttock and the line of the back of the leg;

this point will generally be found to be on a slightly lower level than the elbow.

The crest of the tibia shows as a straight line for two or three inches below the patella, and is more noticeable when the joint is flexed. The common error of the inexperienced draughtsman, when forming this joint, is to attempt to represent it by a series of rather meaningless curves, and a little time spent in studying its construction will amply repay him for his trouble.

Proceeding down the front of the limb we come to the bunch of muscles that extends from the lower end of the crest of the tibia to the hock ; fleshy and prominent above, it diminishes as it descends. The muscle that lies on the front border becomes tendonous before it reaches the hock. Tendons in an animal's limbs may almost invariably be represented by straight lines. Do not overdo the fulness on the outline caused by this group of muscles.

If a straight line is drawn from the crest of the tibia to the most prominent point of the front border of the hock, it will be found that the fulness of these muscles in the side view is more apparent than actual. It is from the posterior aspect that their bulk is more evident. In a muscular, thin skinned horse, the individual muscles of this group can and should be identified (extensor pedis, peroneus, and perforans).

The gastrocnemius is the muscle that gives form to the posterior margin of the shank.

The long cordlike tendon of this muscle

that is inserted into the back part of the summit of the hock (os calcis) is the equivalent of the tendon extending upward from the human heel and is known as the tendo achillis.

This tendon is isolated at its junction with the hock from other muscles and the tibia by a strongly indicated depression.

The gastrocnemius has two heads (this is more noticeable in the back view than in the profile) both of which attach on the lower third of the femur. As the upper half of this muscle is obscured by the biceps it is desirable that the artist should be acquainted with these attachments, and that he should bear in mind that the flexion or extension of the limb cannot divert the direction of the muscle from its point of origin.

The bony construction is largely responsible for the form of the hock and the student who has taken the trouble to become familiar with it will have no difficulty in recognising the principal points of importance, viz., the oscalsis, ex condyle of tibia, and the head of external splint bone. The last two mentioned are connected by a strong ligament (external lateral ligament) that gives rise to the familiar ridge continuing across the hock the direction taken by the tibia.

The tendon (perforatus) which travels from the summit of the hock to the back of the fetlock enables the posterior boundary of the leg to be represented by a straight line, though it is sometimes very slightly convex as it passes over the lower part of the joint.

The remarks already made about the fore limb from the knee down apply equally to the hind limb ; but the pastern of the latter has a tendency to be rather heavier and is generally more upright ; the hoofs also of the hind limb are often more pointed.

When drawing the hind view of the horse, the main proportion should be your first consideration.

Compare the width across the pelvis with the total height of the animal, then ascertain by

FIG. 38.

FIG. 39.

measurement the level on which the hocks will come.

These points we shall expect to find on a normally proportioned horse rather lower than midway between the buttocks and the heels. The same bony prominences of the pelvis and sacrum which affect the surface contours in the profile are important in this view also.

A measurement taken across the hip (or pin bones as they are sometimes called) will give us, the greatest breadth ; only very slightly less is the distance between the trochanters of the femurs, the fullness caused by these two bones being always in evidence on a slightly lower level than the hip bones.

The highest point of the pelvis bones will, in a thin horse, form the highest point of the hind-quarters, but in a well-nourished specimen, it lies in a furrow caused by the masses of powerful muscles that pass on either side of it.

This furrow often extends to the root of the tail, but in the opposite type of horse it will show

Fig. 40.

as a well marked ridge. The correct set on of the tail will help to give character to the quarters; this too is subject to much individual variation.

The hind limb, although it has much in common with the fore limb, differs in at least one important essential.

While the fore limbs are attached to the body by means of muscles only, the hind limbs are securely fixed to the pelvis by means of the hip joints.

The head of the femur rotates in its socket thus enabling the limb to move in any direction. This freedom of action increases the difficulties with which we had to contend when drawing the fore limb from the anterior aspect. As already stated the fore limb is practically incapable of any lateral movement, but the hind limb is not so restricted, though lateral movement does not take place to any considerable extent except in the case of very violent action.

Although the thigh bone when viewed from behind lies in a vertical plane it has a tendency to rotate outward, and this slight outward turn imparts to that portion of the leg from the stifle to the hock, a slightly inward slant, thereby bringing the hocks much closer together than the heads of the femur bones.

A perpendicular line dropped from the point of the ischium cuts the hock, and if continued would pass through the centre of the heels.

It will be seen, by comparing Figs. 28 and 29, that although in the hind limbs the two hip joints are further apart than are the corresponding points of the shoulder in the fore limb, the hind hoofs, owing to the inward slope of the legs from the stifle to the hock, stand a trifle closer together than those of the fore limb.

The student may reasonably ask, "If this is so, how are we to account for the fact that the tracts of the hind foot may always be found immediately behind or touching those of the fore foot?" The answer is "that the slight turn

outward of the leg from the hip joint causes the limb to take a slightly outward direction when travelling forward." If you look at a horse from a three-quarter front aspect you will notice that you obtain almost a front view of the hind limb; the leg travels forward more or less in the direction in which it faces (Fig. 41).

FIG. 41.

The student should become familiar with the large muscles which cover the pelvis and thigh, noticing their points of origin from the median line of the quarters and tracing their courses to their various insertions. A detailed description of these muscles would be superfluous as they can be studied from the well known cast of the anatomical horse or from the anatomy book.

(G. Maximus, G. Medius, Vastus Externus, Semitendinosus, and Semimembranosus.) In an emaciated horse the buttock is separated from the thigh by an accentuated groove between the semitendinosus and the vastus externus; in a better covered specimen, however, this separation is but slightly marked. The shank from this aspect is characterised by its bulk at its junction with the thigh and its thinness at its entrance to the hock.

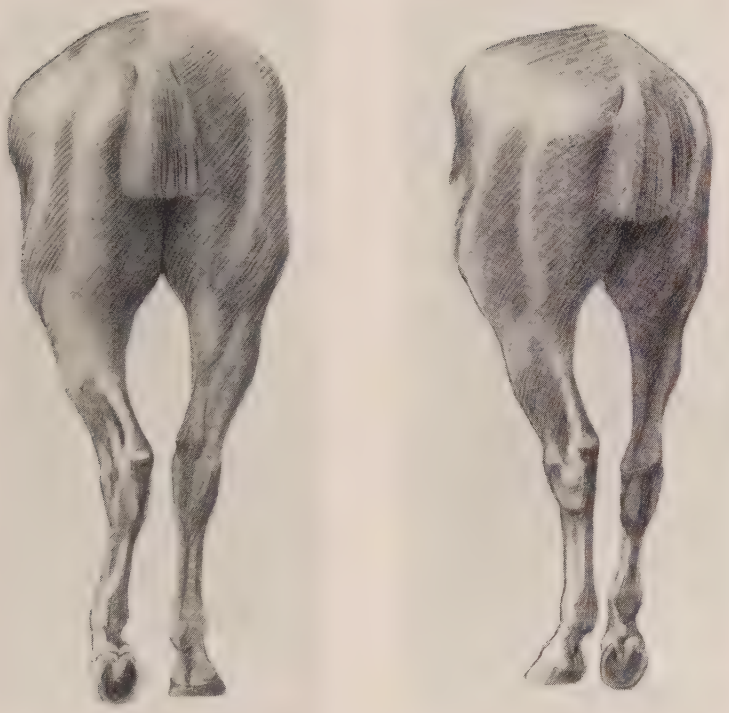
The muscular development is chiefly confined to the external side of the limb; the important group of muscles, referred to when dealing with the profile, is prominent above, but fines down rapidly as they merge into their tendons.

The tendon that gives the outline passes round behind the posterior of the external malleolus of the tibia. On the inner surface, below the large extensors of the thigh, the bone is but comparatively thinly covered and its lower half is plainly discernible terminating at the inner malleolus.

The outstanding feature of this part of the limb is the gastrocenemius and its tendon, occupying as it does the entire posterior surface.

The bony heads of the superior portion of the hock caused by the outer and inner malleoli of the tibia are very apparent when the animal is viewed from behind.

It will be noticed that, as in the knee, the inner of these two prominences is the more pronounced, and that it is situated on a rather higher level than



HINDQUARTERS—SHOWING RESTING LEGS.

[*To face page* 60.

the external malleolus. This inequality in height may to some extent be accounted for by the inclination of the tibia inward from its junction with the femur. Unlike the knee the sides and the hock are not rounded, the extremities of the tibia being connected to the heads of the inner and outer splint bones by straight ligaments, which in this view form the boundary lines of the joint. (Internal and External Lateral Ligaments.)

The deep-seated bones of the tarsus influence the surface forms very little.

The long tendon that travels from the summit of the hock to the fetlock imparts a flattened appearance to the posterior surface of the limb.

When a horse supports the majority of the weight of the hind quarters on one leg, the general appearance of the hind part of the animal, especially when looked at from the back, or three-quarter back view, is considerably changed.

It is advisable when studying this aspect to keep two or three drawings going.

If you particularly wish to make a drawing of a horse resting one leg, it is not a bad plan to occupy your first twenty minutes or so in making small drawings of details ; by this means you may find out which leg the horse has a habit of resting more frequently. Some horses will rest one particular leg almost entirely, this being often the sign of a disease in the foot.

When a horse rests on one leg the whole pelvis is inclined in the direction of the resting limb,

thus bringing the bony prominences previously referred to lower on that side than on the side where the other leg is sustaining the weight of the quarters.

The pin bone and trochanter of the femur on the resting side will not project nearly so much as they do when the weight of the body is evenly distributed on both legs; the muscles of the thigh and flanks, on this side, will lie unobtrusively in a flattened vertical plane.

On the side that supports the weight, the pin bone and trochanter will be forced into higher relief, and the muscles of the flank which are attached to the former will be strained taut, thereby clearly demarking the limitations between the thigh and the barrel.

When dealing with the resting leg the importance of avoiding working two positions into one drawing cannot be too strongly emphasised.

The author has seen a large picture hung on the line at the Royal Academy with a three-quarter back view of a horse placed in a prominent position in the foreground, showing the near leg resting and the off hip dropped; this, of course, was absurd, as it made it necessary to represent the near femur bone half as long again as it should have been, in order to make it reach the extra distance between its socket and the stifle joint.

Imagine what an outcry would be raised if a figure painter committed such an outrageous error.

HINDQUARTERS—RESTING AND NORMAL POSITION.

[*To face page* 62.

The shape of the hind quarters and thigh from the three-quarter front view is rather elusive ; we miss some of that bulk and mass that we have been accustomed to associate with them. It is almost the invariable error of anyone who has not had much practice in drawing horses to exaggerate the dimensions of these parts when representing them for the first time from this position.

The prominences of the pin bone obscure the greater part of the superior plane of the quarters ; the trochanter of the femur will now lie on the posterior border of the thigh, hiding from view all the receding plane of the thigh that lies behind it. The large vertical plane of the thigh will now be very much foreshortened. The presence of an anterior plane, which in the side view has not affected us, now arrests our attention. This plane, consisting of the anterior surface of the femur and the muscles which clothe it (rectus femoris and vastus internus), becomes most evident when the limb is advanced or resting.

The rectus femoris lies on the front of the femur, the vastus internus rather more to the side of the bone ; the inferior attachments of both of these muscles being on the patella.

These forms combine to make an elongated triangular plane, the base of which is formed by the superior border of the patella.

The triangle recedes in the direction taken by the femur, its apex being lost in the fascia of the thigh. Flexion of the stifle joint, as in the action of resting the leg, will have a tendency to cause

this surface to become rather thinner and more convex.

COLT'S HIND QUARTERS AND HIND LIMB

Before leaving the hind quarters it may be well to consider the conformation of this part of the colt in relation to the adult.

When viewed from behind the lack of development of the bony pelvetic structure of the young animal is very obvious ; this gives rise to a strong feeling of lateral compression, the pin bones particularly being much less in evidence than in the full grown animal. A well marked groove will invariably divide the two quarters, the highest point of the pelvis bones (superior posterior iliac crest) never showing as a prominence as in the second type of hind quarters referred to when dealing with the adult.

In the horse, as with all animals, the femur is one of the fastest growing bones in the body.

As a foal generally stands higher at the hindquarters than at the withers, the extreme length of the hind limbs from the stifles down forms a striking contrast to the small hind quarters which they support, thus imparting to the young animal an appearance of extreme "legginess" that is even more accentuated than is the case in the fore limb.

The hock is elongated and the extremities of the bones which influence the surface modelling are more easily identified than in the adult.

Beyond mentioning that it repeats the char-

acteristics of the fore limb, and that the tendons are very conspicuous, there is nothing in the leg of the colt from the hock to the ground that calls for special remark.

FORESHORTENING

Foreshortening always presents a certain amount of difficulty even to experienced draughtsmen, and it is not easy to give any advice on this phase that will be of any real assistance to the beginner. Here he cannot be guided to any extent by a rule for measurements, neither can he make exhaustive drawing of the foreshortened limb from the living model. He must, therefore, fall back largely upon his knowledge of the minor forms which go to make up the whole, and the more intimate his knowledge is, the greater is his likelihood of success.

If accessible to the student he could with advantage study carefully from the well known life-sized casts of horses' legs.

When representing the limb of a horse in a foreshortened position, do not begin by attempting to enclose the whole form in an unbroken or flowing outline; think of it as a solid, as a sculptor would do. Endeavour to show each separate form as it comes towards you overlapping the form behind it, letting your pencil travel round and across the forms with due regard to the section of the portion you are constructing. These remarks apply not only to the limbs but equally to the head and body, in which connection

it has already been pointed out how greatly the harness running round the form will assist in its representation.

If you are standing about fifteen feet away from your model in a foreshortened view, the perspective will be distinctly violent, too violent, perhaps, to introduce pleasantly into a picture, but for the purpose of study it is not an unreasonable distance, as it is difficult to observe the detail if further from the object. Draw the animal exactly as it appears, not attempting to soften off the violence of the perspective in order to obtain a more pleasing study. It will be time to think about adjusting the perspective to meet your purpose when at some later stage you may require to introduce your study into a composition, but even this must be done with very careful regard to the rules of linear perspective.

Now let us suppose that you are looking at a three-quarter front aspect of a horse standing on level ground whose withers are on a level with your eye. If his hind quarters are on the same level as his withers in profile, they will be so now in this view ; the hind feet, however, will seem to be higher than the fore feet—their exact level can easily be ascertained by holding your pencil horizontally between their points of contact with the ground and your eye, noticing how high up your pencil will cross the fore legs. If, however, you are seated, the hindquarters will seem to be on rather a lower level than the withers, as the hind feet will not be quite so high in relation

to the fore feet as they appeared when you were standing. If a student recognises that "when a horse is standing equally poised on all four feet his hoofs may be regarded as forming the four corners of a rectangle," and if he then constructs this rectangle with due observance of the rules of elementary perspective he can hardly fail to get the feet correctly placed.

PORTRAITURE

It may not be out of place to warn the student against attempting a portrait of a horse for a commission in a perspective view. This always leads to adverse comment on the part of your client, as he can never understand why all the four feet are not shown exactly level, and no amount of demonstration or explanations will satisfy him. He usually wishes to have the horse's head turned slightly towards the spectator,—this, if it is properly executed is perhaps a good thing, as it takes some of the stiffness out of the dead profile,—but care must be taken to shorten the neck in proportion as the head is turned ; further, remember (and I feel that this warning is justified in view of the numerous extraordinary errors perpetrated) that merely adding the prominences made by the far eye and nostril does not turn the head. You *must* foreshorten the side of the head and increase proportionately the breadth of the frontal plane, otherwise you will have represented the far eye and nostril as having left their proper

situations without having achieved the desired result of turning the head.

A lot of knowledge useful to anyone who aspires to horse portraiture may be acquired from the study of photographs of the various breeds of horse, such as the hunters, hackneys, etc. Each breed has its well marked characteristics which have been produced by many years of careful breeding and development, and it behoves the artist to understand thoroughly the points of the various types before he undertakes a commission to execute an equine portrait.

As ninety-nine owners out of a hundred are firmly convinced that their horse is absolutely true to type, it is not at all a bad plan to start your portrait by sketching in a typical animal of the breed under consideration, and modifying it according to requirements as you proceed, trying to accentuate the characteristics of form in the animal by which you would recognise it if you saw it again a year or so later, that is, in so far as those characteristics are not to the animal's detriment.

It is generally advisable in order to please your client, to execute your painting on a smooth canvas, and to keep your work free from lumps of paint, as a rough surface is liable to be regarded as indicative of incompetence, carelessness, or a lack of finish.

The portrait painter, unless he wishes to be accused of representing blemishes, should be careful not to accentuate unduly the bony prominences

FIG. 42.

FIG. 43.

FIG. 44.

of the joints, particularly on the lower inside of the hock where the unsightly osseous enlargement known as spavins not infrequently occur.

Capped hocks and elbows though not as a rule causing lameness, are certainly an eyesore and as such should be recognised and avoided. Blemishes known as splints manifest themselves in the form of swellings on the canon bones of both the fore and hind limbs, more frequently the former—they may occur on any part of the canon but are more often found on the inside than the outside. Should an artist unwittingly include such an eyesore in his portrait (particularly if his model be a finely-bred one), he will have depicted a blemish of a more or less serious nature according to its position. The trouble may be regarded as serious when it occurs so far back as to interfere with the action of the tendon which runs down the back of the leg.

Wind-galls are distensions of the sheaths of the tendons, and show as small lumps, containing fluid, on the side of the canon.

Ring-bone is a deposit of bone on the long or short pastern, attacking both the fore and hind limbs, and causing a great disfigurement to the joint. The above mentioned are the principal blemishes which affect the conformation of the limbs, and the portrait painter must be at pains to avoid even a hint of their presence and should endeavour to represent his model as clean limbed and as free from all swellings and fullnesses as possible.

MOTION

The animal painter can hardly consider himself efficient in his profession unless he is competent to represent his animals in motion; to do this, he must make himself conversant with the gaits and actions of the animals.

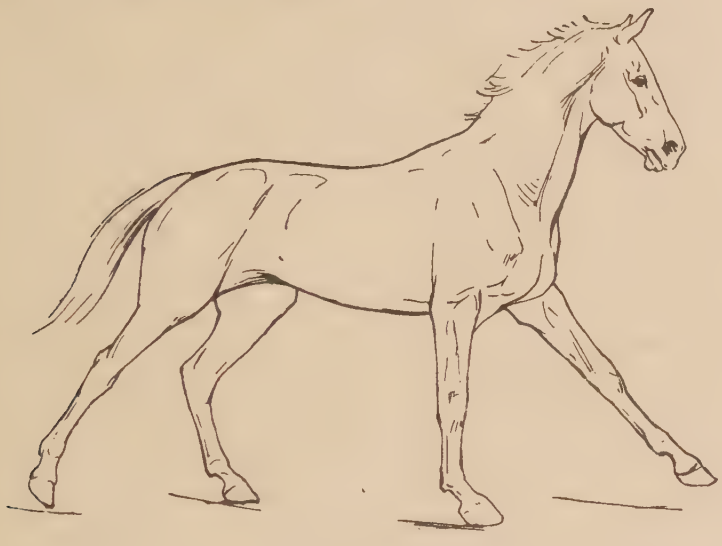


FIG. 45.

The horse progresses by means of well-defined modes of locomotion—the walk, trot, gallop, etc. A long chapter might be devoted to the detailed description and analysis of these actions, but this is rendered unnecessary by Professor Muybridge's series of valuable photographs depicting animals in motion.

The question naturally arises how far the artist should feel tied to placing animals in

attitudes revealed to him as being truthful through the medium of the camera. Would it not be more reasonable to make sure that his drawing suggests movement even at the sacrifice of a certain amount of truth, rather than to stick literally to the facts at all costs ?

It is possible to get hold of some absolute facts concerning locomotion from instantaneous photographs which your unaided eye certainly could never detect, but as an instantaneous photograph shows only one phase of a complete action these truths will as often as not convey the impression of immobility, or arrested action, rather than movement.

Surely the province of an artist is to do something better than this ! He must contrive by judicious selection and adjustment to make the action strongly felt, representing the animal not only in the attitude of the moment but suggesting the position that will be assumed in the next second.

In the past the camera has undoubtedly played a laudable part in calling the attention of both artists and the public to the unsatisfactory, stereotyped rendering of the gallop, which was permitted by convention for so long that it was eventually accepted as the truth—I refer, of course, to the impossible position, with both pairs of legs extended to their maximum limits, that is so familiar in old prints. The failure of these old drawings is twofold, as neither do they satisfactorily express speed or are they true to nature.

The camera, however, has not only exposed misrepresentations in art, it has also revealed truths. For example it definitely settled the controversy that raged over the action of Napoleon's horse in Meissonier's famous picture, "The Retreat from Moscow." Many critics of this picture argued that as a horse does not walk like a camel,

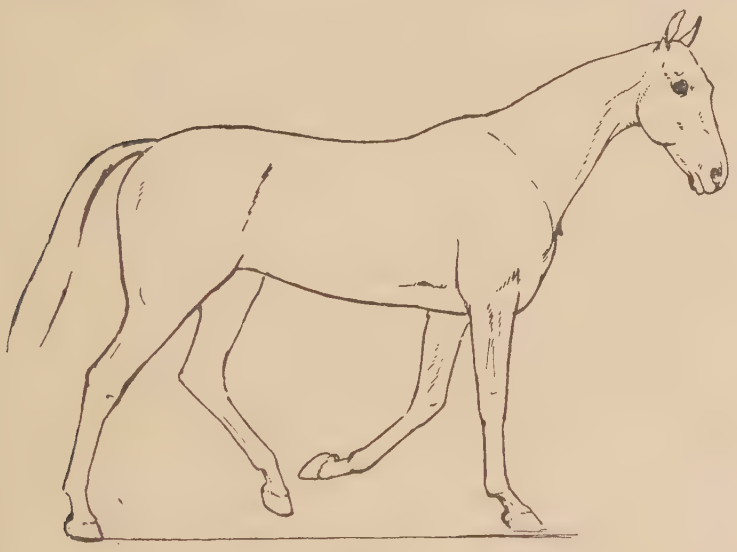


FIG. 46.

by moving the two legs on the one side forward in unison, that it was inaccurate to place the two near legs forward at the same moment. The camera has, however, conclusively proved the contrary.

In the walk a horse progresses by moving forward the diagonally opposite legs in turn. If he starts with the off fore foot, the near hind will be the next to leave the ground, then the near

fore, and last the off hind, the movement of each limb being just one beat behind the one preceding it.

In a slow walk—that is, a walk where the stride is short—two feet on the same side are never off the ground at the same time. In the fast walk, however, with a very long stride, it is possible for this to occur for a fraction of a second just before the hind foot occupies the ground vacated by the fore foot.

When the off fore leg supporting the weight of the body is inclined slightly backward (i.e. under the body) the off hind will be back also and at the same time the near members will be forward—as in Meissonier's picture. (Fig. 47.)

There is a phase in the walk when the two fore feet are both on the ground at the same time which affords an example of the negation of motion, particularly when viewed from the profile; the one leg thrust forward seems to arrest all progress, and the position of the diagonally opposite hind leg passing its neighbour in no way fosters the idea of forward locomotion. (Fig. 48.)

The camera has also revealed to us that the stride of a horse pulling a heavy load will be considerably shorter than that of an unhampered animal, also that the heavy horse in his walk does not lift his feet as high off the ground as he is frequently represented as doing.

The trot differs from the walk in at least two essentials. First: the diagonally opposite hoofs

meet the ground simultaneously instead of following in rotation as in the walk. Second: There is a phase of the trot during which all four feet have quitted the ground, and it is this moment which

Fig. 47.

is generally selected by the artist when representing this gait. (Fig. 49.)

It has been stated that in the ordinary trot the space between the diagonally opposite feet in the air is equal to the distance which separates those in contact with the ground. I have not been able to verify this assertion, but see no reason to doubt

FIG. 48.

it—though this remark most certainly does not apply to the walk. In a slow trot the foot print of the hind hoof will be found to be in the rear of the anterior foot, but in the fast trot the hind hoof print will not infrequently be in front of that of the fore limb.

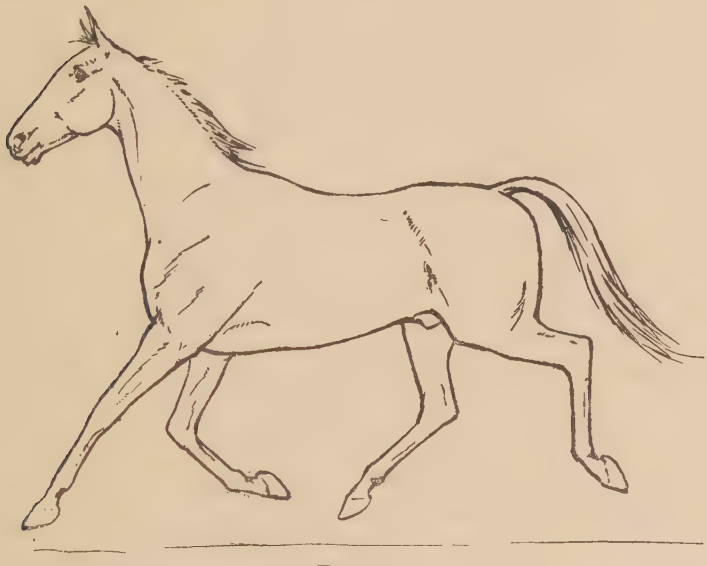


FIG. 49.

A verbal description of the gallop is not likely to convey much useful information to the reader who has probably already made himself familiar with the peculiarities of this mode of progression from the series of reproductions of photographs of animals in motion which have already appeared in various publications, and it will be sufficient to remark on one or two points of interest to the artist.

The gallop is in reality a series of forward leaps in which the horse alights always on the same extended fore foot. This leg, when the hoof comes in contact with the ground, is stretched rigidly forward, and by it the whole weight of the body is received—the momentum carrying

FIG. 50.

the body over the now stationary leg until it is forced back beneath the body to its limit, when it leaves the ground preparatory to making its next stride.

There is no phase in the gallop where the hind and fore limbs are extended off the ground at the same time.

The canter may possibly impress the casual observer as being a slow modification of the gallop, but a closer study of it will reveal, how-

ever, that such is not the case. The canter has the same sequence of movements of the feet as the walk, but without the same regular intervals.

Whether the hoof does or does not extend beyond the nostrils in the gallop has for a long time been a debatable point. Duhousset in his book, "The Gaits, Exterior and Proportions of the Horse," states that it does not, and in support of his statement produces a diagrammatic drawing which he had made from a horse, the head and neck and one of the fore limbs of which had been forcibly extended to their maximum limit. It shows that the hoof was 13 centimetres short of the nose. Nevertheless, reference to photographs leads me to the conclusion that it is quite possible for the hoof to reach if not extend beyond the point attained by the nose: though it is now an established fact that in any gait a horse's knee never extends beyond the nose.

The more free the horse's head the greater the length of his stride, but directly the head is pulled in the stride must correspondingly decrease. You can see this clearly demonstrated if you watch a horse being pulled up from the gallop. At first the head and neck are fully extended, and the fore legs take a full sweeping stride, but as pressure is applied to the reins and the head is drawn in the length of the stride automatically decreases.

It is very helpful when representing a horse in action to notice how the femur and the canon of the hind leg move in sympathy with each other.

It will be remembered that in a horse standing normally the femur bone slopes forward at an angle of roughly forty-five degrees, and the canon is then practically vertical. If the stifle joint is extended, thereby bringing the lower leg more under the body, the canon will be more or less parallel to the femur, and the same thing occurs when the stifle joint is flexed and the leg stretched back—the two bones will still be more or less parallel. It would be quite impossible for the canon to take a forward direction from the hock down while the femur had a backward inclination from the hip to the stifle. A modification of this principle is observable in the fore limb in regard to the movements of the radius and canon, and also in a still lesser degree between the scapula and forearm.

If action is the motive of your composition, all the surroundings of your animal should be made to play their part in helping to express the illusion of motion ; a synthetic line in the sky or ground or the flowing line of a whip lash may considerably augment this impression, but a vertical line, particularly if placed in front of moving animals will be detrimental to the feeling of progress. No accessory is too trivial to be left out of your consideration ; the slightest turn of a head or the flick of a tail may just give the impression you are striving to convey.

In rapidly moving animals the human eye cannot detect detail, and its introduction invariably leads to the loss of speed.

Here the line draughtsman is at an advantage over the painter, as the elimination of all detail from a picture is apt to leave a feeling of incompleteness on the mind of the spectator. There are no fixed rules or receipts that can be handed out which will enable you satisfactorily to express action ; your ends will only be achieved by constant observation and the study of the works of such men as Lionel Edwards and Edouard Luard, who have succeeded as perhaps no one else have done in suggesting that their animals are actually in motion.

CHAPTER II

THE COW

The cow is a member of a group of animals known to zoologists as Hollow Horned Ruminants, or Bovidae, to give them their scientific title. The animals which come under this heading are distinguished from other horned animals by the presence of hollow, unbranched horns ; these horns are never shed as is the case with their allies. In all existing wild species the horns are present in both sexes, but in domesticated breeds we sometimes find that they are absent in both male and female as, for example, the Polled Angus and Aberdeen Angus breeds of cattle.

In some respects cattle bear more resemblance to man than does the horse family, of which fact the principal instance may be found in the formation of the fore limb. The bones that answer to the second and third metacarpal * of the human,

* The method most frequently adopted by anatomists in numbering the metacarpal bones of extinct mammals , i.e., by commencing to count the internal digit corresponding to the human thumb as 1, is apt to give rise to a certain amount of confusion in the mind of the casual reader, as by this means our first or index finger becomes analagous to the animal's second and so on ; so that when it is stated by them that the third and fourth metacarpals have become fused in a rod-like bone, it must be understood that it is actually the bones corresponding to the second and third metacarpals of he human hand that are being referred to.

have, in the cow, in the course of evolution, become welded together to form one rod-like bone ; but the latter's dual origin is unmistakably indicated by the pair of articular surfaces which terminate its lower extremity. On these two surfaces the first phalanges operate. The same remarks apply to the hind limb, but this subject will receive more detailed treatment later when limbs are dealt with in considering the bovidae in relation to the horse tribe. This characteristic of the cloven hoof is in itself important, either from the scientist's or artist's standpoint, but there are several others, one only of which will suffice to mention now, namely, the fact that in the cow and sheep there are no front or incisor teeth in the upper jaw.

It was for a long time supposed that the domesticated breeds of cattle were descended from the so-called " wild cattle " preserved in certain British parks, such as Chillingham and Chartrey—to mention only two of the best known, and that these in their turn were the descendants of the indigenous wild race, the Aurochs ; but the weight of evidence would appear to point to the improbability of the Park cattle being descended from the original wild stock of these islands, and it may reasonably be presumed that these half-wild cattle owe their origin to some ancient domesticated breed.

Therefore it is now generally conceded that the Aurochs, not the Park Cattle, are the ancestors of our domesticated British cattle.

There are to-day some twenty odd recognised breeds of cattle in the British Isles, each of which has its own well marked characteristics of form and colour, which have been developed and improved over a great period of time, by careful selective breeding to meet the requirements of man.

To deal with them individually from an artist's standpoint would, of course, be out of the question in a work of this nature, and it is, therefore, proposed to take the shorthorn as being one of the most typical, popular, and, in the opinion of the author, the most suited to the requirements of the painter.

When painting horses the artist has always to some extent to contend with the ignorant criticisms of the sporting fraternity whose views on art are generally extremely narrow, and whose eyes appear to see nothing but unimportant details to which the artist would willingly be blind. It thus comes about that not infrequently the painter is so influenced, either consciously or otherwise, by the class of public to whom his pictures of horses appeal, that his work in time is apt to degenerate to a level that his clientele can understand and appreciate.

The cattle painter, however, is not annoyed by the comments of the sportsman, though he has frequently to contend with equally ridiculous criticisms from breeders and people of that ilk.

The very idea of an artist selecting for his model an animal which is, in their estimation, a poor

DELICATE ATTENTIONS. W. Evans Linton, R.W.S.

[To face page 84.

specimen of his breed, is to them unthinkable. "Why," they ask, " do you paint such badly-bred animals in your pictures ? The people who are likely to be interested in your work are those who are interested and concerned with cattle, and they do not want pictures of crocks or weeds ! ! "

This may be true enough in its way, but we are not catering for the tastes of farmers or butchers, but for those who have sufficient discernment and artistic discrimination to see and appreciate in a cattle-picture something more than the representation of so much animated beef.

It is written in a book published by the Ministry of Agriculture and Fisheries that " for shorthorn cows, red of a yellowish shade is disliked," and that " distinct patches of either red or white are now out of fashion—blackness or cloudiness of the hairless portion of the nose is objectionable," and that " the horns should be free from black tips." Chacun a son gout—for us, we prefer the yellowish shade to the Devon rubies, and as for the patches, we positively revel in them—they intrigue us.

For the artist there can be no doubt that although the show beast may have something to recommend it, with its massive proportions and sleek well-groomed coat, it is, compared with his humbler relatives, a fat, formless creature, quite unsuited for introduction into a picture, besides, when do we see these aristocrats of the show-ring roaming in the fields ? Not often, fortunately, not often ! No ! their place is in

the beautifully kept model cows' house, which is about as unpicturesque as the cows themselves; there let us leave them while we select for our subject an ordinary everyday cow of the fields, which appeals to us more, and which, if it pleases us to do so, we will paint with all the blemishes and disfigurements known to breeders.

As the opportunities for having cows tied up to study are limited, it is even more desirable that the student should possess an intimate knowledge of the animal's proportions and construction than was the case when learning to draw the horse. Unfortunately this knowledge is not so easily come by, as there are very few really good casts of cows—indeed with the exception of a cow's and a bull's head I am not aware of any life-sized ones. There are several small ones from which the beginner may learn the proportions and gain a superficial knowledge of the general make up of the beast, but this is about all he can hope to gain from them, as the more subtle modelling has, unfortunately, been more or less obliterated by frequent reproduction.

In pre-war days there used to be a firm of photographers who advertised photographs of animals for the use of artists, but unfortunately they no longer include animals in their catalogue.

About the only photographs available are generally those of show beasts whose fat shapelessness renders them quite useless for the student's purpose.

Good drawings of cattle are even rarer, as the

tendency of the modern cattle painter is to treat his animal in a slip-shod fashion, almost sacrificing the form and drawing to tone and effect or cleverness of technique.

The student is therefore forced to rely almost entirely on his own initiative to obtain the necessary data from which to learn, and without which it is almost hopeless to start to draw from the living animal. He is, therefore, advised to do his own photography, seeing to it that his photographs are hard and clear cut, and capable of enlargement. He might also endeavour to interest his camera-owning friends in his work. There are generally a number of people about who are anxious to photograph anything in an objectless way just for the sake of using their cameras, but if it is suggested to them that their productions might be of some practical value they are usually quite willing to direct their energies into a useful channel and some very serviceable studies may be procured in this way.

You are advised if you have not had any previous experience with a camera, to start with a good one, a collapsible one for preference, and to make a careful note of the exposure, aperture and conditions of light for each plate exposed, and you will find that a week or so of practice will probably make you sufficiently proficient to obtain really good photographs, the pick of which you could have enlarged at a small cost.

The photographs themselves alone are of little use to anyone who has had no previous experience

of drawing the animal, for even an accurate tracing made by such an one would entirely fail to convey a correct impression, as the beginner has only a faint idea of what the shapes really are which he is tracing; good results may, however, be looked for by studying the enlargements in conjunction with as good a cast as is obtainable.

Place the cast so as to get as nearly as possible the same view as you have in the photo; sketch in your drawing from the photo, make careful measurements to see that your proportions are correct, then proceed to elaborate it with great care, referring frequently to your cast to make sure that the lights and shades of your photograph are really conveying to you a correct impression of what takes place in the living animal. Be particularly careful—and this is very important—that when drawing the outline you look for and show in your drawing that you have understood where the different forms, bones and muscles overlap each other. Even the best photographs are deficient in this respect in one or two places where the light has not been favourable for defining the detail, and it is here again where reference to your cast should assist you. An outline like wire bent unsympathetically round a limb will never satisfactorily represent living flesh and bone.

PROPORTION OF COW

Draw the beast in every possible position an in various lightning effects. Try to think of

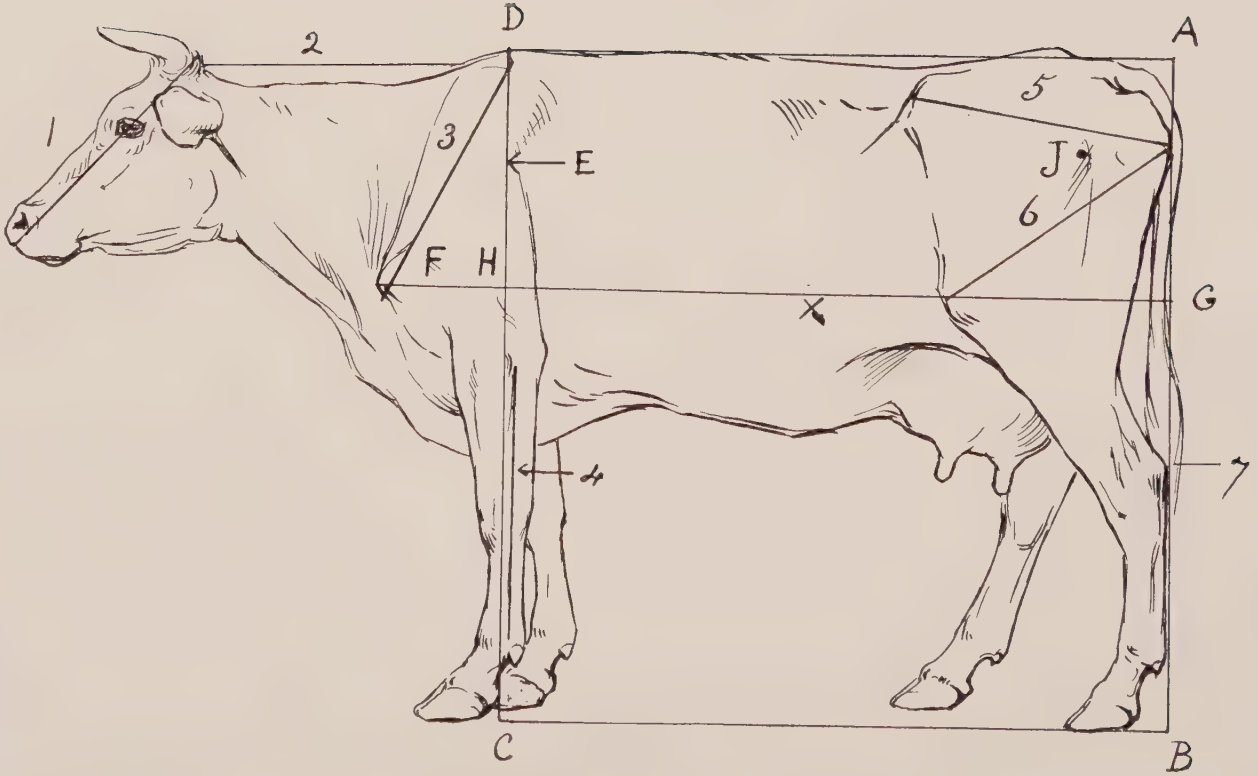


PLATE III.

[Face page 89.

as a sculptor would do, as a solid form, not as a flat object capable of being enclosed in an outline. Endeavour while studying in this manner to memorise the forms encountered, as it is largely on your ability to do so that your success in coping with the living animal will depend later. Test the extent of your knowledge frequently by making memory drawings of the whole animal and of the details, afterwards carefully comparing them with, and correct them from any reliable data that you have on hand.

Take advantage of all the criticism you may be in a position to get from anyone who is more advanced than you are yourself, as a man who knows his animal thoroughly will certainly detect errors that would pass unnoticed by a beginner.

Plate III shows a diagram of proportions. The reader must, however, clearly understand that no definite hard and fast rules can be laid down for the proportions of the cow as individuals even of the same breed vary enormously.

Though a cow is too long in the body to permit of it being enclosed in a square in the manner which was employed when treating with the proportions of the horse, nevertheless a square may be made to serve us if we start by drawing the line AB vertically to the ground and touching the extremity of the buttocks, then completing the square, ABCD. The line CD will be found to pass through the point of origin of the triceps muscle at E. This may be regarded as a fairly reliable standard measurement for shorthorn cows,

but in the case of some of the short-legged breeds, such as the Kerry, Dexter, Jersey, etc., this calculation would be upset. The line drawn from FG is equal to three times the length of the head—this measurement holds good in the majority of cases. It may be worth while to note that the length of the body exceeds the animal's total height by the distance HF.

The numbered lines from 1 to 7 may be regarded as equalling the length of the head, but here again the measurements are not infallible. Let us consider them in rotation. No. 2 is obviously a somewhat unsatisfactory measurement on account of the head being such a movable point, and the exact termination of the line at the shoulders not being easy to locate with precision—furthermore examples are not infrequently met with where the neck is extremely short. No. 2 then must be looked upon as being in the nature of a useful guide only. No. 3 is far the most reliable of the lot, each animal measured conforming very nearly to it; it is taken from the superior border of the scapula to the inferior border of the head of the humerus.

No. 4 is taken from the top of the ex condyle of the humerus to the inferior limit of the canon bone, and may be regarded as fairly accurate for breeds of cows with an average length of leg. No. 5—from the point of the buttock to the pin bone frequently equals but rarely exceeds the length of the head.

No. 6 is another rather unsatisfactory measure-

ment as it only applies so long as the leg is exactly in the position indicated in the diagram. Since the thigh bone revolves on point J, any backward movement would tend to shorten the distance from the buttocks to the stifle joint. No. 7 from the ground to the top of the hock may be regarded as a standard measurement.

There are two other measurements of which no mention has hitherto been made, not because of their lack of importance, but on account of their variability. The first is the depth through the body, this being one of the first main proportions to be ascertained when drawing an animal in profile. The greatest depth goes about three times into the length, sometimes a trifle more, not infrequently a little less.

The second measurement is the distance from the lowest part of the barrel to the ground and this is most important, as to some extent, though not entirely, it regulates the length of the legs. The observant student will no doubt have noticed that the elbow in the cow is not situated (as in the horse) on a level with the lower boundary of the body, but several inches higher up, thus giving to the legs the appearance of being shorter than they really are. What actually occurs is that the thorax or large bony cavity of the ribs is placed lower between the pairs of scapulas and humeri than it is in the horse, with a consequent alteration in the relative position of the elbow. A short time might be beneficially spent in measuring up any data you have collected and seeing to what

extent your conclusions concur with this diagram of proportion. You will certainly get the main idea more firmly rooted in your mind by forming your own conclusions than by blindly accepting those laid down for you.

Fig. 51.

Comparison of the skeleton of the cow with that of the horse will reveal some important differences with which the artist would do well to acquaint himself.

In the profile of the skull we find that the eye orbit, which is larger and more rounded than that of the horse, is situated lower down; the zygomatic arch is longer and thinner and emanates from the side rather than from the top of the orbit—it takes a somewhat backward direction and terminates in an articular surface which receives the condyle and the lower jaw. The

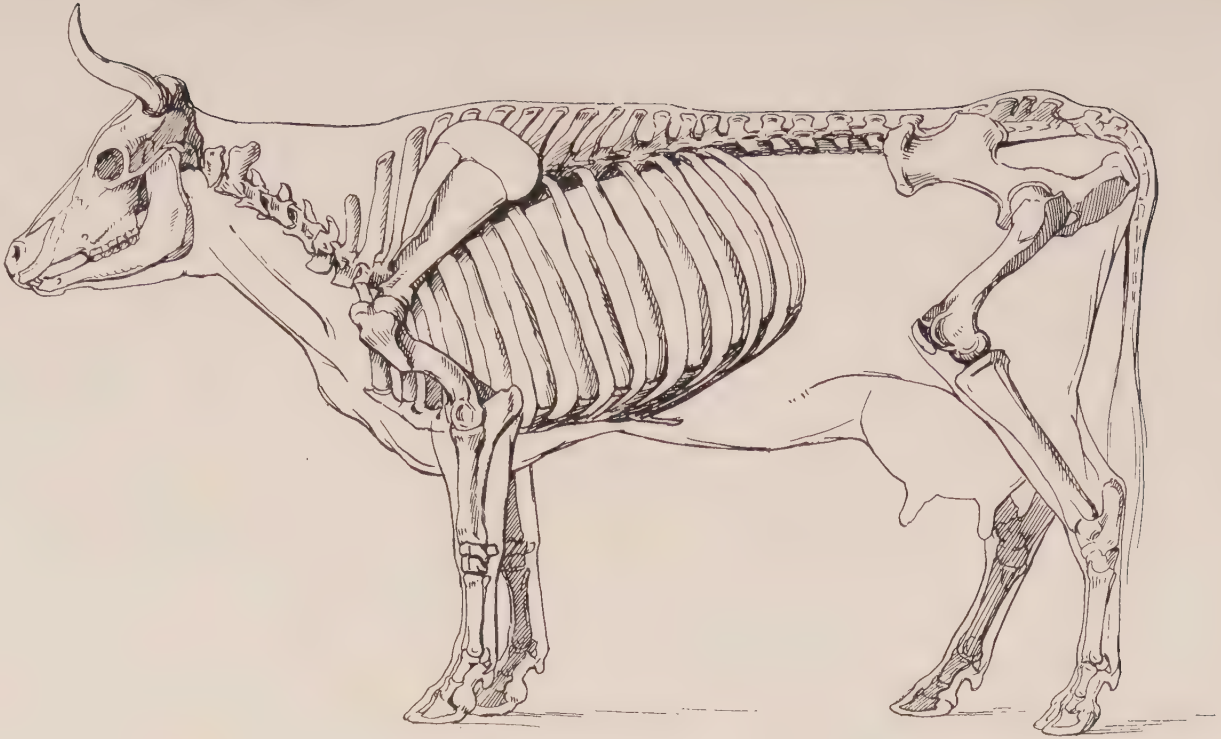


PLATE IV.

[*Face page 92.*

zygomatic ridge which forms such an important feature in the skull of the horse is much less accentuated in the cow, the principal point to notice concerning it being the position of the inferior termination low down in the head and close to the molar teeth.

FIG. 52.

Before proceeding to examine the anterior aspect of the skull your attention may be directed to the accompanying drawing of the cranium of a Jersey cow (Fig. 51), which demonstrates the extraordinary concavity of the frontal bones, accentuating the prominences of the bones surrounding the eye orbits. This type is frequently met with, and it is instructive to compare the outline formed by the frontal and nasal bones with the corresponding parts of the shorthorn and the horse.

When viewed from the front our attention is at once arrested by the width of the skull above the eyes ; this is particularly the case in the bull

or in an animal with large horns, but less marked in breeds with slighter horns, such as the Jersey.

Next we miss the presence of the supra orbital cavities that we have grown accustomed to see in this view of the horse's skull, these recesses now being found to occupy an important position in the side of the skull. The prominent convexities that surround the eye orbits form arresting features in this view as in the profile.

As the bones of the neck (cervical vertebrae) which like those of the horse are seven in number, are deep seated and unimportant to the artist, we need only mention in passing that the spinous process of the second cervical vertebra does not make itself felt on the surface at any time in the same way as it does with the horse.

The junction of the cervical vertebrae with the dorsal vertebrae is made at a point a fraction above the level of the lower end of the scapula, whereas in the horse the spinal column passes behind the scapula about midway between its two extremities ; as a consequence the anterior dorsal vertebrae are furnished with longer spinous processes which reach to the superior limits of the scapula, the crest of these half dozen spines lying almost in the same horizontal straight line, thus doing away with the pleasant curve that goes to form the withers of the horse.

The transition from the dorsal to the lumbar vertebrae is emphasised in the cow by the height of the spines of the former, there being nothing in the horse's skeleton that corresponds to this.

FIG. 54.

FIG. 53.

In the fore limb the cow has nothing homogeneous to the bony excrescence known in the horse as the angle of the scapula ; the form of the spine of the scapula also is somewhat different and should if possible be studied from the bone itself.

In the cow it is more prominent. its maximum elevation being attained in the lower half of the scapula, not in the upper third of the bone as in the horse.

The humerus, which is shorter and not so straight as that of the horse, has the head, trochanter, and deltoid ridge large and prominent and playing an important part in influencing the surface contours of the animal.

The olecranon process is also very pronounced in the oxen.

The metacarpals and bones of the feet have already been briefly attended to, so that it only remains to mention the rudimentary imperfect digits which are represented by the little bones situated between the articulation of the metacarpal and the phalangeal bones. These rudimentary digits are each encased in horny covers like miniature hoofs.

It is almost impossible to give a written description of the pelvitic construction of the cow that would be of assistance to anyone who had not the bones before them for reference.

The actual crests of the iliac are thick and coarse, which causes them to be very conspicuous in the living animal and helps to give the pelvis, particularly when viewed from behind, an appear-

ance of greater width than it actually possesses ; as a matter of fact, in the cow the total width across the iliac crests scarcely equals the total length of the pelvis but in the horse this measurement exceeds the total length. Knowing what prominent features the wings of the pelvis form on the living cow, this is quite contrary to what we might reasonably have expected. The width across the ischii, however, is distinctly greater in the cow.

The femur calls for no particular notice as far as the artist is concerned, but it may be remarked in passing that it is characterised in the ruminating animals by the absence of any projecting process on the hinder surface of the shaft such as is found in the horse family.

The fibula of the cow is extremely atrophied. The splint bones, or rudimentary metatarsals, are less developed in the cow than in the horse and are represented by two small enlargements on the posterior surface of the head of the canon bone.

The remarks already made about the bones of the fore feet apply equally to the hind feet.

Commencing with the head we will now consider the drawing of the different parts of the cow.

The head is so variable in shape and character according to the breed, age and size of the animal that no table of proportions is likely to be serviceable. When drawing a cow's head from nature you can assist yourself by recognising the existence of the well-defined planes referred to when speaking of the horse. (See Fig. 4.)

We find that the frontal plane has lost its coffin-like appearance; at the summit between the horns this plane is wide, but narrows below this level, and again increases rapidly in width

Fig. 55.

as it approaches its maximum measurement between the eyes. The rounded convex character of the lower portion of the frontal plane presents a marked contrast to the flatter character of the nasal bones of the horse; it is at its inferior termination, above and including the upper third of the hairless portion of the muzzle, that the frontal plane again expands to anything approxi-

mating a flat plane. Above the nostrils the full convex surface of the nasal bones melts insensibly into the two lateral planes, the transition being so subtle that to define its exact limits would be almost impossible.

Fig. 56.

The two side planes are formed, above the level of the eye, by the supra-orbital cavity; and on a level with and below the eye, by the masseter muscle, the muscles covering the region of the molar teeth, part of the muzzle and upper lip, and the inferior third of the lower jaw which is subcutaneous. As the inter-maxilliary space is narrow and generously covered with loose skin, the posterior plane is not well defined. These large planes should receive your first consideration before endeavouring to introduce details which, however interesting in themselves, should always be subordinated to the larger planes of which they are a part.

In drawing the front view of the head we must first ascertain the relative proportion of the greatest width—namely across the eyes—compared with the total length. This we find to be considerably more than a third. We also find that this measurement is about equal to the distance from the top of the skull to the level of the bottom of the eye orbits. Make any similar tests of the main proportions that may occur to you as being useful and when you feel that you have the general constructions accurate you can turn your attention to the detail.

Look at the outline of the head between the horns: there are at least two very distinct types to be met with. There is the somewhat pointed type, and the more usual form which has a well emphasised depression in the centre, the whole outline making a shape not unlike a Cupid's bow. This part of the head, or poll, as it is called, is generally covered with coarse hair which to some extent obscures the contours of the skull: but nevertheless its construction can usually be recognised, if it is looked for. (See Figs. 52 and 54.)

Below the horns the outlines on either side of the head follow the form of the skull fairly closely, and here the student who has taken the trouble to gain a really sound knowledge of the skull will reap the benefit.

The appearance of concavity that is so often noticeable on the forehead of a milking cow is enhanced by the prominences that surmount the

COWS' HEADS.

[*To face page* 100.

eyes ; the skin covering these fullnesses is often wrinkled into corrugations which radiate from a point on the frontal bone about three inches below the eye and pass round the form in an upward and backward direction.

The bones of the nose, as distinct from the muzzle, give rise to a convex form which appears to be wedged into the forehead rather above the level of the eyes.

The eyes themselves are situated in the oblique plane and therefore appear slightly foreshortened when viewed from the front.

Under the eyes we find the fulness caused by the muscles surrounding its inferior border, these fullnesses being more pronounced in the cow than in most animals.

Determine the exact position of the lower extremity of the zygomatic ridge, as although this point is not so pronounced as in the horse it is nevertheless an important landmark. Below this point the fullness of the muscles covering the molar teeth forms the outline of either side ; the inferior termination of these muscles is obscured from view by the forms which are a backward continuation of the nostrils.

The hairless portion of the muzzle is always a conspicuous feature particularly when its colour is in marked contrast to that of the rest of the head. The broadest part of the muzzle is across the lips ; the nostrils, you will find, are not so far apart as you would probably have placed them if you had been drawing them from memory without any

previous study ; they are placed in the head at an oblique angle.

In the front view the naked space that separates them may be divided into three distinct planes ; first, that plane which lies between the upper half of the nostrils, which is somewhat semi-lunar in shape with the two points occupying similar positions to that of the tails of the coma cartilages of the horse ; second, the plane which lies between

Fig. 57.

Fig. 58.

the lower half of the two nostrils : and third, the plane which forms the part of the upper lip immediately bordering the mouth.

The lower half of this bare patch, which is divided by a slight midian depression, shows very little in the front view when the head is vertical. The inside of the wings of the nostrils are also hairless and often catch a high light in common with the top of the nose which makes it possible to suggest the general impression of the cow's nose, when painting in oils, with a very few touches.

The horns and ears should be added last, not on account of their lack of importance, but

because they may be regarded as accessories or appendages which are easier to fit on to the head than the head is to fit on to them.

There is a tendency with beginners to commence their drawings at the top of the object and then work their way down. This is quite the wrong method of procedure as it increases the chances of missing the proportions.

The horns give a lot of character and expression to the head, the whole appearance being almost entirely changed by the shape of a horn; they are, of course, very variable in shape even in a particular breed, as they may curve sharply back from the forehead, or curve abruptly downward so as to almost meet under the throat. It is no uncommon thing for the top of a horn to have to be sawn off in order to prevent it growing into the head. But in spite of all these vagaries they all have one characteristic in common which they have inherited from their distant progenitor, the Aurochs; namely, that the horns on leaving the skull almost always travel nearly horizontally for the first few inches in the same plane as the frontal bones; the most usual type then generally take a slightly upward and forward direction, previous to turning more or less abruptly upward. The horns, which are by no means symmetrical, are not easy to draw from the living animal as the slightest movement of the head makes such a great difference in their relative position. It is as well to note that a section through the horns near the skull will not always be circular. The

back of the horn of an old cow is almost always more or less flattened and is often marked by rings and furrows that become less accentuated towards the pointed end.

The ears are worthy of study as they are an arresting feature in the head, but their appearance is too familiar to everyone to require a detailed description ; they are of course very variable in size, and the shape is subject also to certain modifications according to age and sex, the ear of a calf often being longer in proportion to its width than in the full-grown cow.

A bull's ears are short and inclined to be small in relation to the rest of its head.

In an average cow a measurement taken from the tip of one ear to the tip of the other, when they are both at right angles to the neck, will give us one of the greatest widths across the cow ; the greatest being through the point marked X in the table of proportions facing page 89. Notice how, and where, the ears are set on. They appear at first sight to grow from the neck rather than from the head. As a matter of fact the actual orifice of the ear is to be found on the skull in much the same place as that of the horse, i.e., just above the articulation of the lower jaw with the cranium, though the pendulous character of the bovine ears suggests that they are placed lower.

Cattle are unable to rotate their ears to the same extent as the horse does, but have the power of lifting them from their normal horizontal

position of repose to a vertical plane ; or of cocking them forward as in the attitude assumed when interested.

The accompanying sketches demonstrate the outstanding differences in the proportion of the

FIG. 59. FIG. 60. FIG. 61.

front view of the head of the bull, the cow, and the calf. In the bull, the widest part of the head is between the horns, which are much thicker at their bases than are the cow's. The skull seems to expand at the points from which the horns grow. It is a fairly safe rule that a big pair of horns demands a broad forehead to carry them : a small pair, a narrow forehead. The polled

cattle and the young calf being hornless have a narrow, rounded poll, but as the horns of the young animal make their appearance, so the top of the head becomes broader and squarer.

The great bulk above the eyes of the bull compared with the cow causes the nose and the muzzle to look comparatively small. In both the cow and calf the broadest part of the head is across the eyes.

In the calf the muzzle and lower part of the face is decidedly small—this is the case with the young of all animals as the bones that hold the teeth have not yet developed.

The head of the cow in profile may, broadly speaking, be regarded as a triangle, the apex of which is the poll. The first and longest side of this triangle is the anterior boundary of the face ; the second, the inferior border of the lower jaw ; and the third and shortest, the distance between the angle of the jaw and the poll. If the three sides of the triangle are drawn proportionately, the shape of the skull where it comes to the surface duly constructed, and the three planes previously described are realised, you are more than half way towards a complete accurate drawing of the side view of the head, and you are in a position to devote your attention to the details. Having located the position which these details (such as the eye and nostril) are to occupy, you must consider their length, breadth, and height, also their proportion to the whole : that they are lying in their correct planes and are sub-

CALVES' HEADS.

[*To face page* 106.

ordinate to the larger masses of which they form but a part. You will of course, before reaching this stage, have been careful to set the head on correctly, observing the obtuse angle that would have been made if the line forming the upper boundary of the neck had been produced to intersect the line of the forehead.

Note the position of the eye, not only in reference to the length of the head, but also in relation to the anterior boundary; observe also how the prominence above and in front of the eye overlaps the nasal bones; endeavour to suggest the convexity of the oblique plane between the nasal bone and the zygomatic ridge. Notice too how the upper lip overlaps and conceals the mouth and part of the lower lip. Behind the lip the inferior margin of the lower jaw sometimes forms the outline; but often the loose skin or dewlap commences at the back of the chin and embellishes the lower part of the head, throat and neck, and often extends beyond the back of the forelegs. The lower border of the head is generally horizontal when the head is in the normal position of a standing cow.

It may also be remarked here that the anterior portion of the bone of the lower jaw of a cow is small compared with a horse.

The recognition of the three planes of the hairless part of the muzzle already alluded to will help in its construction, though perhaps they are not quite so well defined as in the front view. (Figs. 57 and 58.)

Try to represent it as simply and squarely as possible to begin with and add the curves afterwards.

The nostril contains a lot of drawing, and in this view is not at all unlike the shape of an inverted comma with the tail pointing upwards and forwards. The fleshy part of the nose which forms its upper margin passes into it, and is overlapped by the hair-covered wing of the nostril. Indicate the thickness of the muzzle as it passes into the nostril—this is a little point which is sometimes neglected.

Now let us compare the profile view of the heads of the bull and cow. The triangle into which the former fits is less elongated than that of the latter. The side of the triangle formed by a line drawn from the angle of the jaw to the poll is longer than in the cow, this length being accentuated by the invariable presence of a dewlap which frequently grows to considerable dimensions, particularly in well-bred beasts.

The muzzle of the bull appears small in this view in comparison with the immense bulk above the eye. The eye is situated somewhat lower down in the head and further from the frontal bone than in the cow's, this last point being a characteristic feature of a male head, and one which you cannot afford to miss ; it applies also in lesser extent to steers. The eye itself is small and the upper eyelid is not infrequently surrounded by a more or less naked area which is accentuated in the region of the tear duct.

FIG. 62. FIG. 63.

The bony prominence above the eye and the fleshy fullness below are much in evidence. The head is covered with coarse curly hair from the top of the nasal bone to the poll and extends across the forehead over and under the horns.

The horns of the short-horn bull are short, thick, and comparatively-speaking blunt, and, rarely, if ever, turn up sufficiently to reach a higher level than the top of the head.

The ears, as already mentioned, have a tendency to be short.

The shape of the triangle into which the head of a young calf would fit is of course regulated by the age and size of the animal, but it would not be unreasonable to expect it to occupy a figure about midway in relative dimensions between that occupied by the cow and bull. The outstanding features to notice in the profile of a young calf are the full domed forehead (as distinct from the bony prominences of the bull), the smallness of the muzzle (in which term we include all the details that go to make up the nose), and the lack of development of the lower jaw. These distinctions gradually become less marked as the animal approaches maturity. With the advent of the horns the roundness of the poll is soon modified, while the baby characteristics of the jaw are done away with as more room is required for the growth of the teeth.

Now let us look at the head from the three-quarter back view.

Tracing the anterior outline of the face down-

FIG. 66.

FIG. 65.

FIG. 64.

wards from the horns we travel first in a slightly inward curve, then outward over the fulness in front of the eye. This prominence passes across the portion of the outline which gives the shape of the nasal bone as it passes upward and backward in the direction of the centre of the forehead. The exact position of the crossing of the one form with the other will be affected by the extent to which the head is turned away from you.

If the head is but slightly turned the point of intersection of the two lines will appear to be in the vicinity of the eye, and the more the head is turned away from you the lower this point will be. This view of the nasal bone is rather a difficult one to draw from the living animal as the head is rarely still long enough for accurate observation to be made; and we also have the added difficulty of foreshortening to contend with. Try to ascertain what part of the head the line would intersect if it were produced, and by this means you will probably arrive at a decision as to its direction in relation to the rest of the head. The more the head is turned away from us the shorter the nasal bones will appear. The lower extremity of the head can best be rendered by accurately delineating the wing of the nostril and observing how the superior portion of the muzzle seems to curve round the form of the nasal bones. Here again a turn towards you and you will see the naked part of the nostril—a turn away, and this is obscured by the wing of the nostril which will now give the outline.

Particularly noticeable when the head is turned away is the small but well-defined posterior plane of the upper lip, the drawing of which will help to give the fullness of the muzzle which is such an outstanding feature of this view. The drawing of this aspect of the head will be a good test of your structural sense and a successful rendering of it will require a familiarity with your subject that can only be acquired by practical experience.

The expression of form through the medium of words is not always satisfactory, but it is hoped that Figs. 64, 65 and 66 will serve to elucidate any point which the above description may have failed to make clear.

Behind the occipital crest or poll that forms the summit of the cranium we find a group of bony structures which prolong the skull posteriorly. It is not necessary to examine their composition too intimately, and it will be sufficient for our purpose of we recognise that taken as a whole their influence on the external contours is to form a somewhat flattened plane immediately behind the ridge from which the horns grow. (See Figs. 51 and 53.)

From the centre of this plane, which is practically non-existent in the horse, the ligamentum nuchae and muscles lying thereon (forming the superior boundary of the neck) arise unobtrusively and pass back to their attachments on the withers. The rope-like formation of the group of muscles which serves to support the head is often very noticeable in a thin specimen as it

approaches its junction with the body. The general character of the outline of this form is as a rule concave, since a dairy cow, in marked contrast to the bull and horse, has not a suspicion of anything that can be regarded as a crest. The cow has, in fact, what is commonly called a "ewe neck." When the animal is grazing the straightness of this upper line of the neck is broken by the long spinous processes of the first and second dorsal vertebrae. This is an extremely important item to notice, as it is a characteristic feature which the cow shares with no other animal dealt with in this work. Reference to the diagram of the skeleton will demonstrate that the muscles of the neck, which have their origin in the region of the withers, will, when the head is lowered sufficiently to permit of the animal feeding from the ground, be stretched over the above-mentioned processes in such a manner as to cause them to show as a salient feature, which is not infrequently further accentuated by a growth of coarse hair commencing here and extending backward to the region of the last dorsal vertebrae.

The muscles of the neck of both the cow and the sheep vary little from those of the horse. The mastoid muscles are, perhaps, rather more defined, not so much on account of their own development, but rather because of the lack of the development of the muscles adjacent to them. The inferior border of the neck from the angle of the jaw to the level of the points of the shoulder is generally quite free from the complications of the

dewlap which embellishes the under margin of the bull's head, neck and chest from the chin backwards.

SCAPULA AND FORE-LIMB

As far as the region of the scapula and humerus is concerned the disposition of both the bones and muscles of the ox differs little from the horse's. In drawing this region the student can, therefore, help himself by looking for the same landmarks as before, all of which he will have no difficulty in identifying. As the muscular development of the cow is poor in relation to the horse, we find that the bones play a more important part in influencing the external form. A great part of the outline of the cow's scapula can be detected, the inferior edge being particularly well defined. The spine of the scapula is very prominent and the deltoid ridge and trochanter of the humerus is enormous, the details of the latter being plainly discernible in a thin specimen; as these points are so much in evidence from almost any view of the animal, you are most earnestly advised to try to acquire some first-hand information concerning them. I do not mean by this that you should be content merely to consult an anatomical work; you cannot possibly gain more than a very superficial idea of their form from the best diagrams. I suggest that you should obtain (from a farmer, butcher or vet) the parts referred to, and draw them until you are so familiar with them from all points of view that you are able to represent them

as easily from memory as you can with the object in front of you.

The triceps muscle is decidedly thinner than in a horse. This, of course, is exactly what you would expect to find, for the long exterior of the forearm in the case of the last mentioned animal would be developed by being so constantly brought into play when drawing heavy loads.

The humerus of the cow is a trifle shorter than is the horse's, while it lies rather more horizontally. These facts taken in conjunction with the length of the olecranon process will help to account for the elbow being situated well above the level of the inferior border of the barrel. The correct placing of this point is important inasmuch as it serves to convey the impression that the animal is shorter on the forelegs than is actually the case.

THE FOREARM

In the forearm of the cow and sheep we find the long extensor of the foot divided into two portions. This arrangement constitutes the principal muscular difference that the artist will require to notice between the cow and the horse, in this region of the animal. There are of course complications in connection with the tendons operating the cloven hoof of the ox, but as they do not manifest themselves on the surface it is not necessary to describe them here.

The long slender muscle, variously known to anatomists as the suffraginis and the lateral

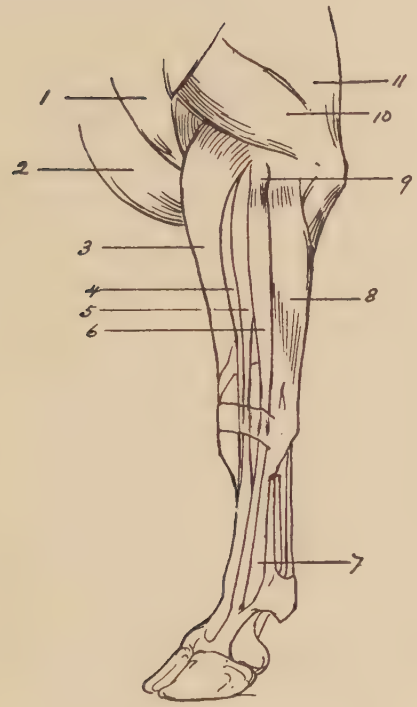


FIG. 67.

LEFT FORELIMB OF OX—EXTERNAL ASPECT

1. Mastoid Humeralis.
2. Pectoralis Major.
3. Extensor Carpi Radialiss
4. Long Extensor of the Digits.
5. Extensor common to the Digits.
6. Suffraginis, or Short Extensor of the Digits.
7. Canon Bone.
8. External Flexor of the Carpus.
9. Condyle of Radius.
10. Short Head of Triceps.
11. Long Head of Triceps.

extensor of the phalanges, to which we have not had occasion to refer when treating of the horse, is situated immediately behind the above-mentioned muscle and is rather more in evidence in the animal now under consideration.

The extensor carpi radialis on the other hand, though the largest muscle in the anterior group on the forearm, is not nearly so well developed in the cow as in the horse; the absence of any marked fullness of this muscle imparts a somewhat flattened appearance to the anterior outline of the forearm.

The posterior boundary can be represented as in the horse by almost a straight line.

The knee of the cow is small, convex in the anterior outline and prominent behind. Slight over-extension of this joint is not infrequent. There is a distinctly tied-in feeling immediately below the knee that would in the horse be considered a detrimental feature.

THE LOWER EXTREMITY OF FORE-LIMB

The narrowness below the knee is emphasized by the manner in which the size of the metacarpal region increases as it descends. This expansion is due to the direction of the posterior outline from the back of the knee to the fullness surrounding the rudimentary digits situated on the posterior of the fetlock. The character of the region of the canon will vary considerably in different types; in the lighter weight varieties of cattle such as

the Channel Island breeds the refinement of the drawing of the lower limb, particularly in the young animal, is reminiscent of the deer tribe.

From the fetlock to the ground the cow is relatively shorter than the horse, but otherwise, in the profile, the two pasterns have little to distinguish them. It is in the hoof that we notice the most marked divergence, apart from the fact that we are dealing with a dual digit.

It will be seen that the heel of the cow is almost on the ground and that the front outline of the hoof is concave rather than otherwise. A close scrutiny of this line will reveal that it is composed of three parts, the first of which travels in a slightly more inward direction than the general line of the pastern; the second segment, which is the major portion, takes a more outward inclination, and the hoof is terminated by a third portion which projecting slightly beyond the rest forms the point of the toe.

FIG. 68.

FIG. 69.

In stall-fed animals and bulls which frequently spend most of their lives in confinement the hoof sometimes grows to enormous proportions and assumes shapes very different from those of animals living a more natural existence. In the animal which has been shut up indoors very little the pasterns often retain their upright calf-like characteristic until they are full-grown, and in such cases the heel will be a little higher off the

FIG. 70. FIG. 73. FIG. 71.

FIG. 74. FIG. 72. FIG. 75.

ground and the toes will play a greater part in supporting the weight.

PECTORAL

The position and shape of the pectoral muscles must not escape our notice whilst dealing with the fore-limb, as owing to the conformation of the cow's chest they differ greatly in appearance from those of the horse. The head of the breast-bone or sternum of the cow is situated on a level about midway between that of the head of the humerus and its external condyle; as already pointed out the corresponding point in the horse is much higher, being almost on a level with the point of the shoulders. In the cow, too, a little more of the sternum and ribs articulating with it are visible in front of the humerus; as these points are the fixed attachments of the pectorals it will be understood that these muscles occupy an area which is essentially a part of the profile rather than of the anterior view. The somewhat pointed shape of the cow's thorax in this vicinity also tends to mark the contrast between the two animals. When looked at from the front, owing to the pointed nature of that part of the cow's chest on which the pectorals lie, the view we obtain of them is a partially foreshortened one; their rounded forms will lie on either side of the dewlap but their superior attachment on the sternum will be obscured by the group of muscles which form the underline of the neck.

A milking cow's shoulders in the front view

are narrow as is also the chest (in the beef types great breadth across the chest is considered a good point). The trochanters of the humeri constituting the points of the shoulders are in this view always pronounced.

FORE-LIMB, FRONT VIEW

In the vicinity of the upper arm the outline will be vertical and flat, or broken only by the deltoid ridge. In the forelegs a cow is often inclined to be knock-kneed; the joint itself is large above and smaller below, the most prominent point being the internal condyle of the radius; the two inferior protuberances are not so well defined as in the horse and are made by the head of the canon bone, not by the splint bones which are placed on the posterior surface of the main shaft.*

Proceeding down the limb we note that, as in the side view, the dimensions of the canon tend to increase as it approaches the fetlock.

In the fetlock itself there is no very outstanding feature requiring mention, though it may be noticed in passing that the rounded character so frequently met with in the horse is not seen so often in oxen, the inner side of whose canon bone carries a small crest the presence of which can be detected on the fetlock of a clean-limbed model.

With this view of the pastern we come to an

* The inner rudimentary metacarpals or splint bone are not always present in oxen.

important point of variation between the one toed (solipeds) and the cloven hoofed animals (ruminants). As already shown when dealing with the skeleton, the cleavage of the digits actually takes place at the junction of the two phalanges with the inferior articular surfaces of the canon bone, but the fact that the phalanges are duplicated is only apparent on the surface immediately above the hoof, where the cleft between the two toes is prolonged upward for about an inch into the pastern.

In shape the pastern is small above and increases in breadth as the pair of phalanges diverge.

When drawing this view of a cloven hoof you will probably find the easiest method of procedure is to block in the hoof as a whole, ignoring the division in the centre to start with : treating it, in fact, much in the same way as you did the horse's, and being careful over your perspective so as to ensure that your animal is really standing with all the under part of the foot in contact with the ground.

Although it has been found expedient for purposes of description and study to examine the limb in segments, the student should be at pains to avoid representing its sub-divisions as being too detached. He must endeavour to recognise and express the subtle inter-relationship between the parts and the whole. Even at the joints which seem to offer a natural stopping-place for his pencil he must feel for the delicate transition from muscle and tendon to bone if he wishes to

succeed in conveying an appreciative sense of unity.

The barrel of the dairy cow is wedge-shape in general appearance (i.e. the body tapering from its greatest bulk behind diminishes in depth as it approaches the region of the forequarters) so that in marked contrast to the horse, a vertical measurement taken through the body at a point immediately in front of the pin-bone will always exceed a measurement taken just behind the scapula from the withers to the sternum. It must be borne in mind that we are now referring to dairy cows, and that this remark does not hold good for animals which are bred for beef.

In your initial sketches of a profile view it is not a bad plan to represent the line of the back as being absolutely straight from the withers to the tail. A long line like this made proportionate to the head and to the height of the animal is a very useful basis from which to work, and once you have it placed you can compose accurately with it the inferior line of the barrel, and later you can return to the line of the back and carefully introduce the details of the forms of the particular model you are studying.

A cow usually stands higher behind than in front; the most salient feature on the whole line of the back in ninety-nine cases out of a hundred is caused by the spines of the sacrum, although this height is exceeded in exceptional instances by the elevation attained by the bones at the root

of the tail, in which case the animal is then termed "Peaky behind." The reverse of this type is said to be "rat-tailed"; here we sometimes see the root of the tail so depressed as scarcely to show above the level of the ischium (this is a common type which is frequently met with in Friesian cattle).

A particularly important point to locate on the superior outline is the slight slip down that occurs at the spinous processes of the last two dorsal vertebrae; the line from the withers to this point is generally horizontal, but unless your model is uninterestingly fat the change in the height of the vertebrae can always be detected here. Occasional instances are met with where the back bone is curved upward to such an extent as to elevate this point to almost the highest level of the back. Again the reverse of this form is found in the hollow-backed type of animal frequently seen in Guernsey cows, in which stamp of beast the concavity of the back is generally followed by a corresponding fullness of the inferior outline.

BARREL

Growing from the region of the last dorsal spinous processes above referred to, we find the last rib leaving the spine in a backward and downward direction; this rib is important as it marks the posterior limit of the cage-like form of the thorax and at the same time forms the anterior boundary of the strongly emphasized triangular

cavity that lies between the thorax and the pin-bone, the angular prominence of which bone it serves to accentuate. Attaching to the pin-bone is a large muscle which passes in a forward and downward direction and seems to suspend the thorax—this showing more plainly on the cow than on the horse.

The ribs, which are in number thirteen pairs,* are much broader and flatter and usually more conspicuous than those of a horse.

The lengthy dorsal spinous processes in the region above and behind the scapula are responsible for the ridge which is the equivalent to the wither of the horse. As the muscles on the cow's back are not banked up on either side of these processes in the same powerful manner as in the horse the withers of the former are much thinner through.

In fact the slight concavity which can usually be noticed behind the cartilage or prolongation assumes in a thin beast the aspect of a well-marked depression which throws the shape of this portion of the scapula into strong relief.

In thin animals prominences on the bone will show as such on the surface, but in muscular high-conditioned creatures these attachments for muscles will be so embedded that their presence will, in many instances, be felt as depressions.

HINDQUARTERS

Take, for instance, the back of a powerfully-

* Horse 36, Cow 26, Aurochs 28, American Bison 30.

built draught-horse in the pink of condition, and compare it with the back of a dairy cow; in the former the spinous processes of the vertebrae are depressed between two banks of bulging muscle, and in the latter the backbone stands out in a gnarled crest from the shoulders to the hindquarters.

Figs. 76–78.

It can hardly be too strongly insisted on that a knowledge of the bones and where they lie immediately under the surface of the skin is highly desirable to anyone aspiring to become an efficient draughtsman of animals.

The superior boundary of the hindquarters has already been briefly described when speaking of the barrel; the possible variations in type of this line are infinite, and it is most instructive to stand in a cows' house, where you can see the tops of perhaps a dozen hindquarters at the same time, and notice how they differ from one another; no other part of the animal is subject to so much variability, and it would hardly be an exaggeration to say that after you had become familiar with the form of this portion of each individual it would be

possible to distinguish them from each other by the irregularity and vagaries of this line alone, without receiving any guidance from the colour or markings. (Figs. 76, 77 and 78.)

In the horse the hindquarters are the most rounded part of the animal, in the cow they are the most angular.

The principal points of similarity and difference between the pelvitic structures of the two animals have already been pointed out when dealing with the skeleton, and it will be recalled that apart from the elevation of the sacrum of the cow the two animals have much in common as regards the most important bony projections.

The arrangement of the main planes of this region also is not dissimilar. We have the large superior plane, which will receive more detailed consideration later; and the triangular, vertical plane described in the horse as lying between the pin bone, the trochanter of the femur and the stifle joint, which is also to be found in the cow occupying the greatest part of the thigh area; almost a flat surface in the normal specimen, but in a thin model there is a depression between the pin bone and the trochanter which causes the form of the substructure of the pelvis to be visible.

The long vastus muscle passing behind the trochanter of the femur in the direction of the stifle forms an oblique plane which recedes from the back of the triangle just described, towards the posterior boundary of the thigh. The semi-tendinosus lying behind the long vastus and form-

DIAGRAMMATIC DRAWING TO SHOW PRINCIPAL PLANES.

[*To face page* 129.

ing the outline of the limb makes a narrow minor plane, which is less receding than the last. (See illustration on opposite page.)

The arrangement of the muscles on the hind-quarters of the ox is such that the divisions between the muscles are not so apparent as in the horse. The long vastus has, for artistic purposes at any rate, been merged into the gluteus so as to form practically one muscle. The semi-tendinosus has no sacral prolongation ; it arises from the ischium —hence the modelling of the superior plane will be determined more by the bones than by the muscles.

Turning our attention to the outline for a moment, we notice that the line which encloses the ischium slopes from the front downward and backward until it reaches the most prominent point of the buttocks from where it drops almost vertically.

This long flowing line, which sometimes, when the leg is back, descends in an unbroken concave sweep from the buttock to the hock, is essentially bovine in character and lacking in power when we think of it in relation to the well rounded muscles of this region of the horse. When the leg is in the normal standing position this line is slightly broken where the muscles of the thigh are crossed by those of the lower leg ; the exact position of this juncture should, when it is discernible, be carefully indicated in your drawing. You will find that it lies on a decidedly lower level than that of the stifle joint, and rather above the level of the inferior boundary of the barrel. You

might, with advantage, carry these tests one step farther and compare the height of these points with the fore limb. In a fat animal the vertical line from the buttocks drops to a lower level, concealing the upper portion of the gastrocinimius and thereby shortening the distance from the back of the thigh to the hock.

The stifle joint occupies a less conspicuous position on the cow than it does on the horse; placed as it is well within the confines of the body and away from the outline its silhouette is never seen.

The loose skin uniting the limb to the body, which in the horse arises above the patella, in the cow has its beginning much lower down the limb, in the region of the crest of the tibia, and from here it sweeps upward and forward above the udder in a long curve which composes synthetically with the line travelling from the buttocks to the hock.

HIND LIMB PROFILE

The superior portion of the tibial segment of the leg, or shank as we may call it, is closely united to the thigh, and covered by the large muscles which insert in the region of the head and crest of the tibia. It is only the lower two-thirds which stand clear from the body and upper limb.

It will be unnecessary for the reader to worry himself about the complexity of the muscles of this portion of the limb and how they differ in

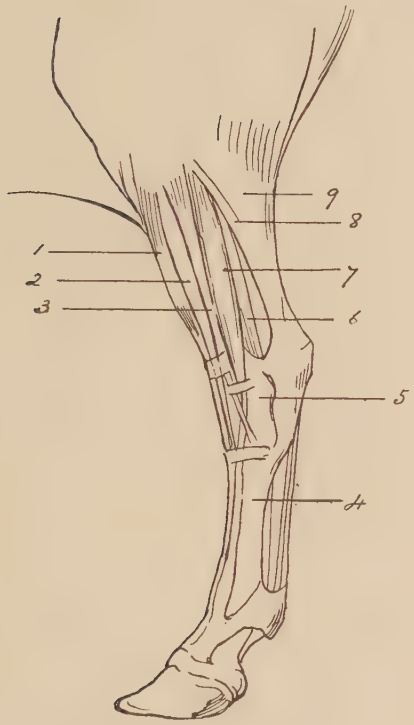


Fig. 79.

LEFT HIND-LIMB OF OX—EXTERNAL ASPECT

1. Extensor of the Digits.
2. Second portion of the last-named Muscle.
3. Peroneus Longus.
4. Metatarsal Bone.
5. External Malleolus.
6. Perforans, or Posterior Deep Flexor of Phalanges.
7. Peroneus Brevis.
8. Soleus.
9. Gastrocnemius.

detail from the horse's, as the accompanying figure will give him the essentials from which he will see at a glance that the chief groups of muscles are massed in a very similar way to those of the horse. The variations of the individual muscles affect the surface form very slightly, but can of course be detected on a thin animal by anyone who knows what to look for.

Though your object is not to make an anatomical drawing of the creature, it will be readily admitted by all except the frankly indolent, that a familiarity with all the component parts which constitute the general aspect of the objects you desire to draw will help to impart to your work a spontaneity and conviction which would certainly be sadly lacking from a drawing executed without this knowledge.

Although the number and arrangement of the bones of the hock are not quite identical with those of the horse, the manner in which they affect the surface-modelling differs so little that special comment on this joint is unnecessary, unless it is to remark that the ridge made by the external lateral ligament is in the cow very pronounced; but this feature is more apparent when the joint is viewed from behind.

Below the hock the drawing of the limb is comparatively simple. The outline from the oscalsis to the rudimentary digits can in the initial stages of your drawing best be represented by a straight line, normally vertical, though it is not rare to find an individual which habitually stands

with its feet well under the body; this slant of the limb, when present, should of course be carefully noted. When you have sketched in the proportions and position of the rest of the leg and foot it will be time enough to return to the posterior boundary and introduce the more subtle passages of the outline. Notice that there may be a tendency towards fullness over the small bones of the hock, which subsides when the tendon* passing down the back of the leg is reached;—again in the vicinity of the fetlock a slight fullness is noticeable.

It is the outward tendency of this line which is mainly responsible for the lower part of this segment of the limb being larger at its junction with the fetlock than it is just below the hock. The anterior outline is sometimes crossed in front of the head of the metatarsal by a large vein, which travels the whole length of the bone and can also be seen crossing the fetlock obliquely.

The introduction of large veins into drawings and paintings often appears to present a stumbling-block to beginners, and it must be confessed that there is an element of difficulty connected with their representation. Though details, they are often very conspicuous and cannot in the making of a study be entirely ignored. A picture would probably be benefited by the elimination of such underfeatures. The tendency frequently is to overdo them, and by getting them too hard cause them to appear to be lying on top of the

* This is really a group of tendons.

skin rather than under it. The best way to treat them is, perhaps, to work across the form rather than let your pencil or brush follow the course of the vein, as by the former method any undue hardness is likely to be avoided. This may seem a small point, but it is trifles like this that often go a long way to ruin an otherwise passable piece of work.

The hind feet closely resemble those of the fore limb, but there is a tendency for the hoofs of the former to be larger and more elongated.

Turning to the posterior aspect we find that the bones of the pelvis plays a similar part to those of the horse in influencing the surface forms of this region. The most noticeable difference, apart from the proportions referred to when comparing the skeletons, being that while the greatest elevation attained by the bones of the horse's pelvis was marked by the superior posterior iliac crest, in the cow this point is exceeded by the bones of the sacrum, which stand out in a central ridge which lends emphasis to the two hollows existing on either side of it between the two pin bones. Though all the bony prominences are very much in evidence in the cow's hindquarters, it is doubtful if they constitute a more important distinction between the two animals than do these two strongly marked depressions. They are, of course, accounted for by the lack of muscular development. While the horse has the concavity between these two points banked up by some of the most powerful

muscles of the body, developed by constant use and breeding, the cow is here but sparingly covered either by muscle or fat; indeed, lean hindquarters in a dairy cow are regarded with favour and as a sign of quality by farmers, who consider that fat carried, particularly in this neighbourhood, is an indication that the animal's food is going to make flesh rather than milk.

Another item to be observed in this view is the manner in which the different types of tail variously affect the drawing. The peaky type vies with the spinis of the sacrum for a place on the outline, while the rat-tailed variety lies flatly between the two points of the buttocks.

Examine also the two pin-bones and get to understand their significance. You will see, if you look at them from this point of view, how each of the pair has two corners, an internal and an external. Now step round to the side of the animal and you will observe that the internal is situated higher and in front of the external angle. If you have a convenient opportunity look at this superior plane of the hindquarters from above. You can find out a good deal worth remembering about the appearance of a cow when viewed from above from a cast, as you can see it easily from any angle and this knowledge will prove very useful when you are drawing cattle lying down.

The muscles (semimembranosus and semitendinosus) which attach at the point of the buttocks form the posterior vertical plane, the

limits of which are well defined except where a small plane made by the biceps and outer head of the gastrocnemius seems to be wedged between the semitendinosus and the long vastus—here the side of the posterior plane becomes merged.

Fig. 80.

The absolute back view of a cow would probably not be very useful for pictorial purposes, but it is as well to draw your model from as many points of view as possible, and this is a good one from which to start your study of the hindquarters and limb. The author would be inclined to advise you to confine your attention to the profile and back view of the animal until you are quite familiar with the different planes described above before proceeding to draw it from any other angle, as a movement backward or forward of the leg considerably changes the appearance of the thigh.

Words seem quite inadequate to cope with the explanation of these subtleties of form and no

attempt will be made to describe further the details of this region, except to say that when the leg is back, the foot is sometimes pointed inwards; and when this is the case the biceps femoris and the external head of the gastrocnemius become much more prominent than under normal conditions (this is particularly noticeable with calves). When the foot is forward the two above-mentioned muscles seem to merge more into the posterior edge of the long vastus.

Perhaps it is as well that cattle do not share with the horse tribe the habit of resting a foot, and thereby dropping a hip on the side on which the foot is rested, but although they do not actually do this, a cow will often stand with one leg well back with the hip on that side distinctly lower than the other. Also it is by no means an uncommon thing to see a cow standing with a decided lateral bend in its spine, that is, with the chest facing in one direction and its hips slightly in another. You are probably familiar with the expression " Cow hocked " as applied to a horse. This term is used to describe an animal which stands with its hocks together and its feet pointed outward in a manner fairly typical of the cow's normal attitude. (Plate IV will demonstrate the point.)

The hock is long and thin when seen from behind and the os calcis, which corresponds to the human heel, stands out in strong relief from the rest of the joint. The shape of this bone makes itself felt very distinctly, and (as will be

noticed by referring to Fig. 75, which depicts the left hock), the summit of the heel is more rounded on the internal than on the external side, which is inclined to be angular.

The two superior prominences on the hock are caused by the lower extremity of the tibia; you will observe that they are not quite a pair, the internal being placed higher than the external, while the latter also is rather larger than the former.

This is not exactly as the student of human anatomy might reasonably expect to find, as in man the reverse as regards size is the case.

The head of the canon bone in conjunction with the two extremely rudimentary metatarsals is responsible for the two inferior enlargements of the joint.

Proceeding down the limb we see that the tendon which passes down the back of the hock makes a narrow, flat plane, which expands as it passes over the posterior surface of the fetlock. This expansion, which is much more apparent in the cow than in the horse, may be accounted for by the presence of the two rudimentary hoofs or ergots of the former.

Observe the manner in which these two little digits are set on. They may be likened to two inverted triangles with their apexes turned slightly away from the centre line of the limb, thus suggesting the feeling of radiation that is common to the digits of all animals and with which we are so familiar in the human hand.

When studying the feet, the student might do worse than adopt the method employed by the author when drawing Figs. 71 to 75 on page 120, namely :—Procure from the butcher the lower extremity of the limb. You certainly will, by this means, have more opportunity for close observation than you would be likely to get from the living animal, as apart from the incessant movement with which you would have to contend, the hoof would probably be hidden by grass or litter, or its definition lost in the bad light of the cows' house. A day or two spent in intimate study, making large scale drawings of feet (which are under your own control) will, if you study intelligently, advance your knowledge ten times further than reading all the text books in the world.

Of course you must bear in mind when dealing with the dead foot that its appearance is somewhat modified by the absence of the weight of the body pressing on it. In the living animal this pressure would tend to make the pastern slope more, and to cause the two sections of the hoof to spread apart.

We are sometimes called upon when depicting a cow in motion to draw a foot which is not in contact with the ground ; this is by no means easy as we have no opportunity of having a long look at it under these conditions, and we are forced to rely on our memory. Do not forget when drawing a foot under such circumstances that more movement is likely to take place between

the long and short pastern than when the weight of the body is supported by the foot.

THE BULL

The bull differs so remarkably in general appearance from the cow that at first sight anyone who was not familiar with the animals might be forgiven for imagining that they are the representatives of two distinct species.

In addition to the fact that the bull is much more sturdily built than the cow, the most outstanding characteristic of the male is, that whereas the cow carries most of its weight behind, the bull is comparatively light in the hindquarters and massive in front.

As the heads of the two sexes have already been contrasted at some length, we will commence our comparisons at the neck ; here we find that the bull carries an enormously developed crest, which not only causes the profile outline to be very full, but the neck is also very thick between the ears. The dewlap, which is always large and may take a variety of forms, enhances this feeling of the bulk being placed in front. The legs are short and strongly made. This shortness of limb, considered a good point in the bull, is emphasized by the fullness of the dewlap which sometimes reaches well below the knee.

In the forearm the measurement across from the elbow to the front of the limb is considerable.

In the hind limb and hindquarters the bones

BULL'S HEAD

[*To face page* 140.

are generally well-covered and do not obtrude themselves on the surface to the same extent as those of the cow.

You must remember when you are contemplating the introduction of the bull into a group of cattle that his natural picturesque qualities are not unlikely to have been partially destroyed by the breed. As he is one out of many bull calves specially selected to propagate his species on account of his appearance, we must not be surprised to find in him many of the objectionable features (from our point of view) which characterize show beasts. This remark does not apply to the cow to nearly the same extent, as the heifer calves even when considered poor-looking specimens often prove good milkers.

Most of what has been said about the foal when compared with the horse applies also to the calf when considered in relation to the adult, the extreme length of the legs and the great size of the joints being particularly noticeable as exemplified by the head of the humeri and femurs. The calf like the colt stands lower at the withers than at the headquarters. The pelvis of the young animal is narrow and the wings of the ilium or pin-bones are quite undeveloped; the head of the femur on the contrary forms a very conspicuous protuberance on the hind quarters.

The hind limb seems to be peculiarly lacking in stamina; the calf usually stands either with the two hocks in close proximity, with the feet pointed well out, or when taking a stride forward,

the foot that is back is twisted inward in an ungainly manner.

It would be a great help to you when making your first attempts to draw from the living animal if you could prevail on the owner of cattle to have a quiet animal tied up for you. Unfortunately this is not so easily accomplished, as most farmers are under the impression that such a procedure interferes with a cow's feeding and consequently adversely affects her milk production. Even if you do succeed in persuading him to see matters from your point of view, you will not necessarily have accomplished much that is likely to benefit you unless the animal has been accustomed to be tethered out of doors; as even a quiet cow, which may have been chained in the cow-byre all the winter, will grow nervous and restless, and behave in a most exasperating fashion when her liberty out of doors is interfered with.

A method which I have found to answer fairly well on several occasions with young animals is to have four strong stakes driven firmly into the ground in the form of an oblong. The stake to which you propose to tether the animal needs to be a stout one and capable of withstanding considerable strain.

When you have your animal between these posts you can either encircle them with a rope, or better still, if the materials are available, lash strong horizontal poles to the four uprights so as to enclose the creature on, at least, three sides.

OIL SKETCH FROM NATURE.

To face page 142.

If possible, have your model tied up well away from other animals as their near presence has an unsettling effect upon the captive. Of course this method is only practicable when the animal is small enough to be more or less forcibly handled and even then it is advisable to have an assistant at hand to keep an eye on your model, who generally at first objects strenuously to this treatment; but when he finds that no harm comes to him and that his efforts to escape are fruitless he generally settles down eventually and gives the artist his opportunity. If the day is hot and the flies are troublesome a most refractory subject can often be reduced to a state of comparative calm by a tactful assistant brushing the pests off with a branch or handful of bracken.

If the experiment is repeated with the same animal on the following day he will generally prove much more tractable.

It is essential that the stakes used should be of sufficient height to preclude any possibility of the animal injuring itself on them in his struggles.

Whenever you have the chance of studying from an animal tethered in the open (unless of course you particularly require a study from another aspect) select always a front or a three-quarter front view. Your opportunities of becoming familiar with these points of view will be comparatively scarce, as walking backwards in front of a grazing cow is a very awkward proceeding.

As you cannot always get animals tied for you, never lose an opportunity of drawing them when they are standing about waiting to be milked, or when, as is the practice in many parts of the country, they are actually being milked out of doors.

Then also let your first attention be given to those views which are not so readily obtainable at other times.

The cows' house gives you a good chance of getting some careful studies of the hindquarters and hind limb, and as the light will be steadier than it is out of doors you will be able to carry your drawing to a fair stage of completion ; also the knowledge that your model will be waiting for you under similar conditions next day will encourage you to work on a larger scale than usual, standing to an easel, perhaps, which enables you without inconvenience to adjust your position to the movements of your model so that you always obtain the same view.

In winter dry cows and heifers are often confined in yards, and offer a better opportunity for drawing than you get when they are at large in the country, for although the movement is incessant, at least the whole herd cannot get up and walk right away from you. It is not, however, desirable to make your colour studies for pictures under conditions where your models are surrounded by walls and outbuildings, as the open-air effect is often lost, and the animals' coats instead of reflecting the sky become very

local in colour and much of your interest in the painting is consequently lost.

The glossy coat of an animal reflects the colour of its surrounding in a most wonderful and fascinating way. Look at the colour that is reflected from the ground—let it be green grass or red earth on the belly of a white cow for example; and even the colour of the sky at the horizon plays its part in determining the exact tint of the vertical planes, this being very noticeable in the evening.

Your studies for pictures should always be made as much as possible under the conditions and in the surroundings in which you eventually intend to depict your subject. If you neglect this precaution (which is after all only common sense) your picture is bound to suffer—it will not hang together as a whole and even the uninitiated, though they may not be able to tell where the fault lies, will be aware of something lacking, and will feel that your work is unconvincing.

Following cattle about in the fields is a fatiguing but necessary part of the animal painter's training, and it is often disappointing at the end of a morning's work to find that you have so little to show for your effort; so much of your time has of necessity been spent in waiting for the cow to assume the position you selected to draw.

Be careful not to work two views of the animal into one drawing. To avoid falling into this error, it is a good plan at the commencement

of your drawing to pick up a couple of points in your model, and notice their relative positions at the moment when you have that view of the model which you intend to represent: and thus as you proceed a rapid glance at these two points will be a near guide as to any change that has taken place in your point of view. For instance in a three-quarter back view take the position of the prominence caused by the last spinous processes of the dorsal vertebrae in relation to the pin-bone. Or if your view is more of a back view notice if, or how much, the pin-bone crosses the scapula.

If you are confining your studies to line drawing, provided that you retain always the same view of your model, you will be able to follow the animal about the field in all directions; but directly you extend your researches to tone and colour your difficulties are at once multiplied, as it is then necessary that your model should be walking in one direction all the time or the light and shade will be altered.

You will find that it is more satisfactory when painting grazing cattle to do so in a large field. The herd is much more systematic in its feeding than may appear at first sight to a casual observer. It starts at one end of the field and drifts slowly its whole length before it turns about to repeat the process. For the return journey you will be of course supplied with material for another sketch. A little unobtrusive guidance may sometimes be judiciously employed to induce your model to

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SUNLIT PASTURES. W. Evans Linton, R.W.S.

[*To face page* 146.

walk in the required direction; this may be accomplished by stepping round on to the side to which it has a tendency to stray, but you must be at pains in so doing to avoid alarming the creature or it may walk to the other end of a large field before pausing to feed again and your morning's work will thereby suffer.

It is difficult to know what method is best to recommend for carrying an oil sketch when following cattle. Each painter has his own pet device, all of which appear to have some drawback. Satisfactory paintings of animals have been made from nature on a Hook easel. This plan has the advantage that you are able to work on a much larger scale than if you were carrying your sketch, but it has the great disadvantage that the artist's mobility is hampered, in that he is obliged to pick up this ungainly contrivance between every few strokes of the brush.

Many animal painters consider the pochard box, on the grounds of its lightness and portability, as the best device for the purpose; but useful as it undoubtedly is, its diminutive size precludes the possibility of your obtaining any more than a few notes of tone and colour on a very small scale.

A better plan, in the experience of the author, is to have a light framework of a box about fourteen by ten inches, the lid of which is formed by one of the two panels which it is capable of carrying and the bottom of which may be used as a palette. A box of this type though much

lighter than the ordinary paint box of similar dimensions, is too heavy to be carried on the thumb in the manner of the pochard box, but can be suspended round the neck by a strap attached to two studs on the side of the box.

The great disadvantage of this method is that as the palette lies horizontally the paint on it catches a top light and shines in a manner that frequently makes a nice discrimination between the more subtle tints well nigh out of the question.

All things considered, perhaps the most serviceable device is the following :—Take two stout canvasses mounted on stretchers approximately the dimensions of your paint box ; attach two of the long sides of these stretchers to each other by means of a pair of hinges, so that the one canvas which is to be horizontal forms a sort of tray, while the other operates on the hinges in the same way as does the lid of a paint-box, and can be adjusted at any angle to suit your requirements by means of a similar fitting to those supplied to hold rigid the lid of an open paint-box. This contrivance can, like the last, be carried suspended from the neck by a strap attached by studs to the side of the horizontal stretcher. The left-hand stud should be placed as far away from you as possible, but you will have to use your own discrimination as regards the best position for the one on the right. The right-hand end of the strap is sure to interfere to some extent with your hand, though this annoyance can be partially overcome by placing the stud to suit your own individual taste ;

but it should be remembered that by placing the studs otherwise than opposite to each other, you will be imparting to the device a tendency to be continually slipping out of the straight. The strap should be broad enough to avoid cutting the neck and should be provided with a buckle in order that you can adjust its length.

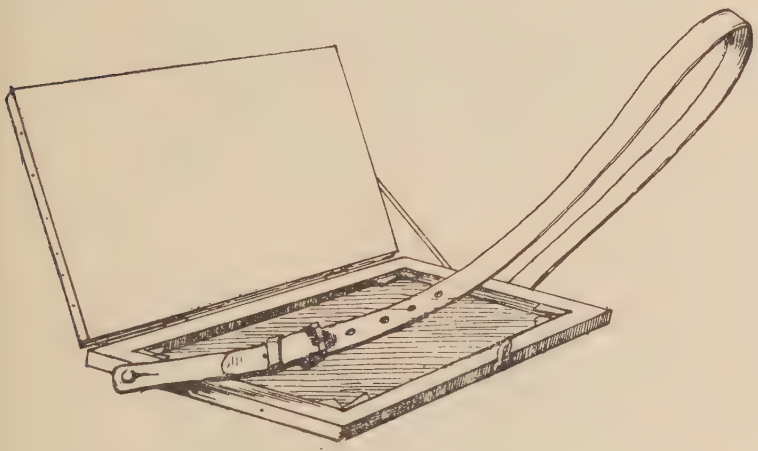


FIG. 81.

On the vertical surface you can either pin the piece of canvas you intend to work on, or you can fix a panel by means of clips, or any other means you may devise, such as four short wire nails driven into the stretcher and then bent over at an angle, so as to form hooks.

You can, if you feel that it is necessary, make the arrangement additionally firm by attaching to the middle of the long edge which is resting against you a leather loop which can be buttoned on to your waistcoat.

But to return to our cattle ! Do not attempt to follow young calves about in open spaces—it almost invariably proves to be a most disappointing procedure and leads to nothing but a waste of time. These young animals walk much faster and do not graze so systematically as do their parents ; calves also have the disconcerting habit of bunching together as they feed, thereby partially concealing each other from view ; added to this, they are rarely on their legs long enough to allow the artist to do more than begin his study when they sink to the ground again.

Even when lying down it is difficult to get a good study of them as they do not remain in one position as long as their seniors.

The thinness of their hides renders them more susceptible to the attack of insects, and when one youngster is disturbed he generally is not satisfied until he has roused the whole bunch.

If you want to really study calves you will be almost compelled to do so when they are in confinement.

Even by following the quiet milking-cow you will experience considerable difficulty in making a sufficiently comprehensive and complete study in one painting to meet all your requirements for a picture, and if you take out your study at the same time next day to continue with it your paint will most likely be dry or unpleasantly sticky and as a result all your superimposed touches will sink and dry a tone darker than when you put them on. This is most regrettable as you have

CALVES' HEADS.

[*To face page* 150.

then spoilt and rendered useless your study of the preceding day.

A plan that you could practise with more satisfactory results is to copy accurately on another panel the work done the day before, matching the tones and colours with meticulous care, and when satisfied that you have precisely simulated those of your original study, you can mix a small quantity of the most prevalent tints, not forgetting the ground colour, so that you will be able to approach your subject with your palette and brushes systematised and your paint fresh and ready to work with at the stage when you left off the previous day.

FIG. 82.

It is when the herd is lying down that the cattle painter has most occasion to rejoice, as this is the best opportunity he gets to study animals in their natural environment. Some secret code, the key of which it would be useful to discover, seems to govern their action with regard to the times at which they rest. They select unaccountably one period of the day for lying down. One

morning you may find every herd within sight lying down—on the next that they are all grazing, though the climatic conditions be apparently identical with those prevailing on the preceding day. There almost appears to be a telepathy existent between them which causes them to act in unison. Cattle will generally lie down before rain during the hottest part of the day, and after morning milking. They usually graze in the evening.

It may not be out of place to remind you that your approach to a resting-herd should be made as quietly and unobtrusively as possible if you hope to settle yourself conveniently close to one of its numbers. Bear in mind that cows are naturally rather nervous creatures, and that your incursion into their domain is being viewed with a certain amount of apprehension on their part. Do not jeopardize your morning's work by being too precipitate. Should any of the animals show signs of uneasiness at your approach, do not continue to walk in their direction, but circle quietly round them, drawing gradually closer at the same time. They may have been lying down for some time before you arrived, and if, by undue haste, you arouse one of the beasts, it may be the signal for the rest to get up and commence feeding. The author has had this experience so often that he feels the above hint to go circumspectly is not unwarranted. As likely as not you are the only person the animals have seen in their field from one week's end to the next, except the person who feeds them.

A word of reassurance to lady students who may be timid of cows may be given here. You may take it for granted that generally the cow is a great deal more afraid of you than you are of her. If you doubt this, try to approach one close enough to touch it and you will find that in the great majority of cases the creature will move away before you can put your hand on it.

The cow with a newly-born calf, particularly if it is her first, is an unknown quantity, which it is not unreasonable to treat with a certain amount of caution.

A bull is, of course, another matter altogether. The fact that one is loose in a field may generally be taken to indicate that in the estimation of the farmer the animal is safe, but there have been more fatal accidents with alleged quiet bulls than with those bearing a bad reputation. Never entirely trust a bull, even though his character is beyond reproach. In ninety-nine instances out of a hundred he may act up to his reputation, but on the hundredth he may make himself remarkably unpleasant, and this without the warning that the bull is popularly supposed to give before commencing hostilities. A chapter might be filled with anecdotes of bulls, but as these would be more likely to keep the student away from the animal than to encourage him to draw it they had better be omitted from this volume.

Everything taken into consideration, it is more advantageous to sketch with a large herd, as not only have you a larger choice of models to select

from, but also the chances that some of the herd may lie for longer is enhanced.

When you have been sketching the same herd for some days and they have become accustomed to your presence, you will probably find that you will be able to work your way quietly into the centre of a group of them when lying down without disturbing them. If you succeed in doing this, it is satisfactory, should the first model selected move, to be able to turn your attention to another, without being obliged to change your position and thereby run the risk of creating a further disturbance, as you might have to do if you were seated on the outskirts of the herd. Cattle do not lie down for such a long, unbroken period as you might imagine. An hour and a half is exceptional, and you are lucky if your model does not get up within the hour. A herd may be in the one place for the whole morning but the individual will rise up, stretch, and lie down again, usually on the side opposite to the one on which it was previously lying.

Another advantage gained by working day after day with the same herd is that you get to know which animals are in the habit of lying down most.

An old cow needs more rest than a young one, and if by chance you should notice a lame one you may be hopeful that it will be an animal which will spend more time on the ground than on all fours ; and it will be worth your while, if such turns out to be the case, to bring any sketch of it,

which you had previously started, out with you again, on the chance of being able to catch her once more in the same position.

From the first glance at a recumbent herd a novice might receive the impression that the animals were lying in an infinity of different

Fig. 83.

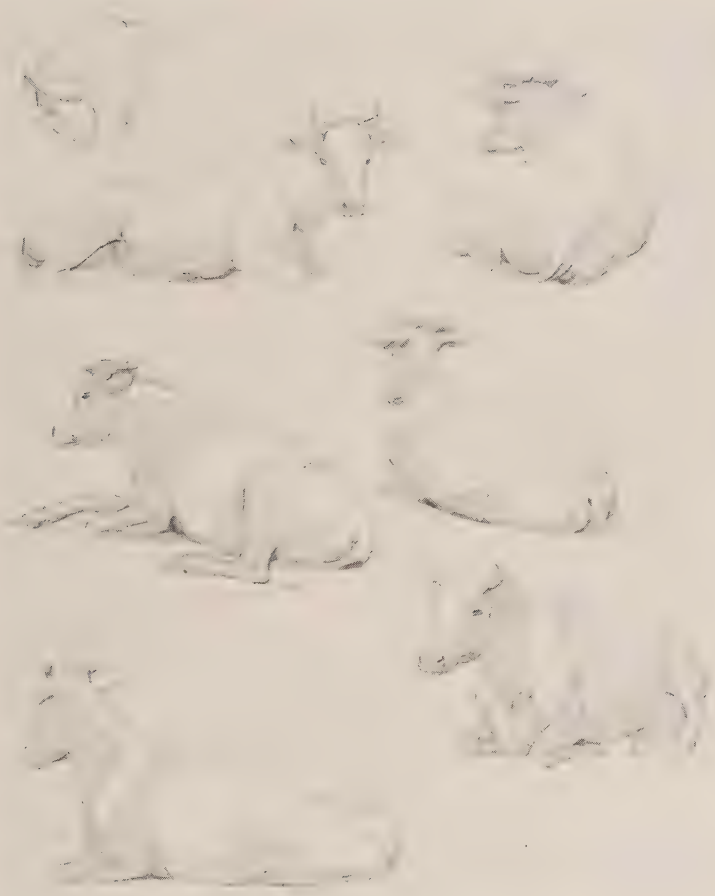
attitudes, but a careful examination will show him that the poses adopted are variations of the same position—that is, if we exclude from our consideration the position where the animal lies flat on its side.

A cow lying down has the weight of the forequarters fairly equally distributed on the two fore limbs and, provided that neither leg is thrust forward as shown in Fig. 83, the points of the shoulder will be equidistant from the ground.

Behind the forequarters cattle lie more or less always on one side, one hind limb being invariably under the body, thus imparting to the pelvis a downward slope in the direction of the thigh on which the animal is resting its weight. The angle of this slope will of course be governed by the extent to which it is rolled over on its side. With cattle in the lying position the pelvis is never horizontal, as is often the case with the dog or cat when these animals are lying with their hind legs arranged symmetrically.

Another factor which introduces variety into the lying position is the extent to which the spine is curved. Sometimes the centre line of the back may be almost straight from the withers to the tail, but often this line is rendered more pleasing by the curvature which is imparted to it when the animal lies with the forequarters facing in a slightly different direction to the pelvis.

You should, when drawing the hindquarters, identify the bony prominences of the pelvis and place them accurately in relation to each other and to the backbone. Be careful also as to the position of the stifle joint, which when the animal is lying down is apt to assume an unfamiliar appearance. Do not forget that this is not a fixed point; its position is liable to alteration according as the leg is flexed or extended, a fact which is mentioned here to warn you that the misplacement of this joint is by no means uncommon in pictures of cattle. No excuse is valid for such a piece of malconstruction, for the



NOTES FROM NATURE.

[*To face page* 156.

misplacement of this joint will affect the length of the thigh bone.

No doubt there are some painters of the slap-dash school who introduce animals into their landscapes as accessories who would argue that as long as the general impression of the creature was conveyed all that was necessary had been accomplished. Few sane painters, however, would be disposed to accept such excuse for ignorance and slovenliness if the model on which distortions were practised were a human being. Why then should negligent constructions pass without censure where the animal is concerned ? After all, if a form is indicated at all it may as well be in the right place as in the wrong.

When viewed from behind with the eye well above the level of the highest part of the animal, one cannot help being struck with the width across the hip, and the narrowness of the superior plane of the back at the withers. Notice too, the flat plateau that lies between the pelvis and the two last ribs. In this lumbar region the influence of the spine on the external surface is often but little felt.

Take note of the direction of the ribs ; in profile they pass from the spine downward and backward, but when seen from behind we gain more idea of how they grow out from the spine—at first, almost at right angles.

When standing to draw a back view of a cow lying down you should be on your guard against creating the delusion that the animal is sitting up

in rather an unnatural attitude. The perspective is rather violent and the drawing when quite correct may conceivably still convey this idea. You can combat the tendency to overdo this impression by testing, by means of a pencil held horizontally, how the level of the points where the forelimbs are in contact with the ground compares with that of any convenient landmark on the hindquarters. Take, for example, the knee or the forehoof if the leg is extended, and ascertain its relative position to the hock or the pin bone.

Another point to bear in mind in this connection, when composing a cattle group, is inconsistency of perspective between your standing and your lying animals. If you have been standing to make your sketches of the one and sitting for the the other, one set of studies will require some adjustment in order to make them compatible with the other.

Which set of studies you adopt will be determined by the height on which you elect to have your eye level. A high horizon will indicate that you were able to see over the back of a standing cow, which being the case you would be capable of seeing more on to the top of the lying animals than is shown by the studies which you made when seated.

The pose of a resting cow lends itself admirably to purposes of composition. A view giving us a graceful curve can so easily be found, so forming a natural and pleasant termination to a group or a happy rounding off to an awkward angle.

FIG. 84.

CHAPTER III

SHEEP

There are some thirty odd separate breeds of British sheep, all of which are distinguished from each other by more or less well marked characteristics.

As it would be quite outside the province of this work to deal with the points peculiar to these different breeds, it will be sufficient to remark that for purposes of classification the length and character of the wool, the presence or absence of horns, and the colour of the face and legs are the chief determining factors, all of which are subject to considerable variation.

It is worthy of notice that in some breeds the horns are present in both sexes, in others these appendages are entirely absent, and again, as in the case of the Welsh mountain breed, to quote but one instance, they are present in the ram but absent in the ewe.

Sheep seems to have inspired but few painters sufficiently to induce them to paint pictures the motive of which has been supplied entirely by these animals. Perhaps the reason for this is that the similarity which one sheep bears to another

may rob it of much of the individuality attaching to other animals. The artist feels that no one member of the flock possesses that touch of distinction which will elevate it above the level of its fellows. Or it may be that their size compared with horses or cattle renders necessary an entirely different treatment of their surroundings to that which would be employed when painting a picture where larger animals form the sole reason for its existence.

To be consistent, an artist who paints a group of sheep sufficiently close up to make a searching study of them might not unreasonably feel constrained to treat their immediate environment in the same detailed fashion. If he has adopted a realistic treatment when representing a fleece, he will probably feel obliged to express in like manner the foreground, and any other natural forms or growths in juxtaposition to the animal. The small work entailed for the successful rendering of these details is not as a rule to the taste of anyone who loves outdoor work. To handle the painting of an open-air group of cattle in the same method as might be employed by a painter of still life does not appeal to many (especially those of the more modern school) as making the best use of the material which nature has given us to select from.

Probably the student of animal painting will not be content to regard sheep as merely useful accessories to a landscape, but will agree that the happiest pictorial results may be obtained by

refraining from going to the other extreme and painting them at *too* close a range.

Regarding them from this standpoint he will find that sheep lend themselves very readily to pictorial arrangement. They seem to group themselves more naturally than most other animals, and the painter is further assisted by the fact that his eye is well above the level of their backs, and he has not, therefore, to contend with the difficulty of breaking or getting away from a row of straight backs as he so frequently has to do when composing horses and more particularly cattle, the level of whose backs more nearly approximates to the level of his eye than does the sheep's.

The very uniformity of the colour of these animals, which at first sight may appear a trifle uninteresting, can be turned to good account when the animals are dealt with in a mass. How much more charming and simple a solid flock of self-coloured sheep would look when introduced into your picture with half of their number under a strong blue shadow, than would, say, a herd of parti-coloured goats under similar conditions.

The opportunities for obtaining reliable data from which to study sheep before attempting to draw the living animal are few. The one or two casts which may be in existence are probably inaccessible to the average student. This is unfortunate, as it is, perhaps even more desirable that we should approach the sheep with some sound working knowledge than was the case when studying the two animals already dealt

with. The opportunities which present themselves for intimate or prolonged observation of sheep will be comparatively few. Also the possibility of having the creatures tied or held for us is, in this instance, out of the question. The student is, therefore, advised (as when preparing himself to draw cattle from nature) to become his own photographer.

The susceptibilities of the reader may be shocked if it is suggested to him that he might procure a sheep's head from the butcher, and make a few large careful drawings from it. It is certain that were he to do so he would get an opportunity of careful observation at close quarters which he would be unlikely to obtain when working from the living model.

In recent years there was a striking picture in the Royal Academy depicting a flock of sheep as an important feature in the foreground ; the heads of all these sheep were painted from death with quite satisfactory results. The practice of calling the butcher to your aid could be extended to other portions of the animal besides the head—the legs and feet for example would be useful.

Even in a shorn sheep the muscular formation is a good deal obscured by the wool, and it is really hardly necessary for anyone to pry beneath the surface of the skin.

This remark is not intended to discourage the reader from making any investigations which he thinks would help him, as he cannot know too much about the objects he is painting, whether

they are animals, trees, or the forms which go to make up the foreground of his picture; but because he possesses a complete understanding of trees and other growths it is not necessary for him to introduce all his knowledge into his landscape, any more than it is desirable that because he may have a sound comprehension of the construction of an animal he should anatomize every animal he paints.

You must learn to use with reticence the knowledge of nature which you have been at such pains to acquire. Your animals though correctly constructed must not look like anatomical studies; and your foreground though ringing true should not be a botanical transcript from nature.

The introduction of animals into landscape should be made with a unity of vision that will not permit of the painter's anatomical knowledge dominating everything else with which he is dealing. The modelling on the animal should always be subordinate to its environment and should be expressed with no more emphasis than has been employed to render the inanimate surroundings.

Our survey of the skeleton will be of the briefest.

The skull is the portion of the bony structure which calls for the most attention from the student, as, owing to the fact that in many breeds a great part of it is coated only by fine hair, its form is very evident.

Figs. 85 and 86 showing the side and front

view of the skull will demonstrate more clearly its outstanding peculiarities than would any amount of description. In the front view the immense width across the skull on a level with and immediately above the eye orbits form a striking contrast to the craniums of the two animals previously discussed. The two prominences above the orbits

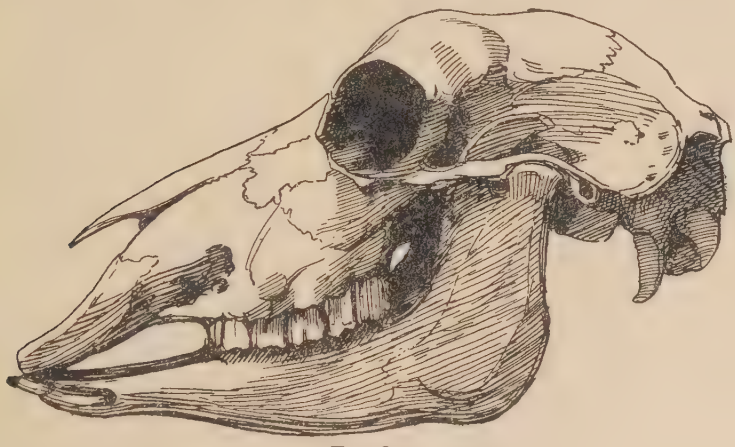


FIG. 85.

show rather more clearly in nature than is evident in the drawings.

Where horns are present they grow from this pair of excrescences. In Fig. 85 the student will also notice the receding character of the forehead. Careful measurements of the skull are not likely to be of any great assistance, as not only are some portions of it obscured by the wool, but it is subject to variation in different breeds.

In the neck the projecting process of the second vertical vertebra of the sheep simulates that of the horse rather than the cow, and is important

in that its presence is not infrequently felt on the surface.

The scapula tends to be short. The deltoid ridge of the humerus is so slightly developed as to be of no consequence to the artist.

Fig. 86.

The forearm is proportionately longer in the sheep than in the cow and the ulna extends the whole length of the section of the limb.

The structure and arrangement of the metacarpals and bones of the lower extremities of the limb is not dissimilar to that of the ox.

The pelvis is not placed so horizontally as is the case with the cow, but slopes at a much greater angle downward from the pin bone to the buttocks as shown in Figs. 87 and 88. This structure is compressed laterally, and is free from the angular protuberances that were so marked a feature in the region of the horse and more particularly of the cow, though nevertheless it is the points corresponding to those which gave form to the surface in these two

animals which we shall find influencing the external contours in a lesser degree in the sheep.

The shank is long in the sheep, and as in the cow, a rudimentary fibula is present, the shaft of which is replaced in these animals by a fibrous cord which sometimes becomes ossified and may in such cases resemble the fibula of the horse tribe.

FIG. 87.

The point of junction between the cervical and dorsal vertebrae is situated on a much higher level than in the cow, the backbone passing behind the scapula not more than halfway down. If reference is made to Plate IV, showing the skeleton of the cow, it will be seen at a glance that this junction was effected in this animal on a level with the lower extremities of the scapula.

FIG. 88.

With regard to the proportions of the sheep it is questionable whether any table of measurements can be drawn up which would be likely to prove serviceable to the student. Such diagrams have been reproduced in works dealing with the anatomy of animals, but their practical utility seems doubtful in view of the variability of the individual animals.

The reader is recommended, when he gets the opportunity, to apply to sheep the same standard

measurements as he used when studying the horse, and to observe how far his model conforms or diverges from the set of measurements.

The wild species of sheep most nearly allied to our domestic races were capable of being fitted into a square in the same way as the horse as shown in Fig. 1, but long domestication has had the tendency to increase the length of the body at the expense of the height of the animal. In show animals this feature is looked upon with favour by the judges. Fig. 89 represents a shorn sheep the proportions of which may be regarded as fairly typical. If the square test be applied to this diagram it will be observed that while the body is relatively much longer than that of the horse, it is distinctly shorter in proportion when compared with the cow.

It is not so much in the actual proportions or anatomy that the sheep differs from the horse or cow as in general character. For instance the habitual carriage of the sheep's head and all animals nearly allied to them is high. While the normal position of a cow's head may be regarded as being on a level with its back, a horse's may be looked on as being a trifle above the level of the withers—a sheep's is held more in the position indicated in the diagram.

Another peculiarity which can hardly fail to arrest attention is that the highest point of the back is formed by the lumbar vertebrae, not by the withers, as in the horse, or any part of the hindquarters as in the cow.

The fact that the animal stands rather lower in front than behind is more noticeable when the head is down in the attitude of grazing.

With reference to the drawing of the head :—

In profile some assistance may be gained from the practice we employed with the preceding

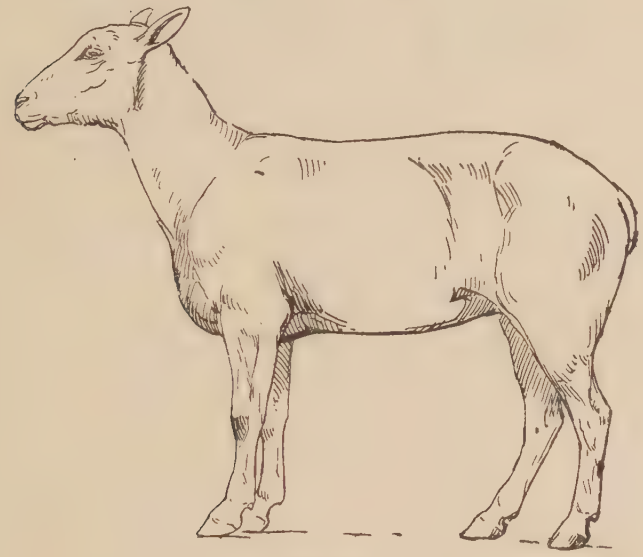


Fig. 89.

animals of enclosing the head in a triangle, but in so doing we must not fail to recognise the decidedly receding character of the forehead which to some extent causes the outline of the head to appear more egg-shaped than triangular.

In the adult of most of the Down breeds, which are generally either black or brown-faced (as is the case with the Southdown) the boundary between the wool and the short hair of the face

is insisted upon by the change of colour. This is rather an assistance as it divides the head somewhat abruptly into two well-defined portions.

The pencil drawings at the bottom of illustration show a full-grown Hampshire down and a lamb of the same breed. Notice the way in which the wool grows on the forehead and poll, leaving covered only by short hair the two bosses above the eyes from which the horns (in a horned breed) would grow. The presence of these marks can be detected in all the drawings on this Plate, their exact positions being liable to slight variation in the different breeds. Young lambs have the face almost entirely covered with wool, which gradually wears off as they reach maturity.

The convex curves of the nasal bones are responsible for the Roman nose which is so typical of sheep and goats.

The sweep of the anterior outline of the face is only interrupted by a slight depression above the nostrils.

The nostril itself is not conspicuous in the profile. In the full face the pair of nostrils take the form of a V. The median cleft in the upper lip shows more decidedly in some types than in others, it being rarely so well-defined in our domestic breeds as in wild sheep or goats.

The long narrow ears though erectile are normally pendulous, and their length in a shorn beast or an animal whose head is naturally free from wool is rather striking.

The neck of the sheep is decidedly long when

PENCIL SKETCHES OF SHEEPS' HEADS.

[*To face page* 170.

considered in relation to the previously-mentioned animals.

Although the bones of the neck, as already stated, are attached to the trunk in the region of the top of the shoulders, the sheep experiences no difficulty in reaching the ground when feeding. There is no necessity to straddle the forelegs in order to diminish the distance from the withers to the ground.

The nape of the neck in the shorn sheep grows from the back of the head in such a manner as to make it a difficult matter to discern precisely where the head terminates and the neck begins. The prominence of the spine of the second cervical vertebrae so influences the outline in this vicinity as to suggest that it is a part of the posterior prolongation of the skull.

There is a distinct tendency for the line which forms the superior boundary of the neck to take a double curve. It leaves the head in a convex form, but there is a feeling of concavity associated with its approach to the withers. The shape of the neck broadly speaking is more or less cylindrical with a tendency to be rather larger at its juncture with the body; a section through it would be inclined to be circular rather than triangular as in other ruminants. There is, however, rather a flattened plane on the top of the neck which is most in evidence in a front or three-quarters view of a grazing animal.

The head of the sternum which forms the attachment for the inferior line of the neck with

the body, is placed rather in advance of the points of the shoulders; in this particular the sheep resembles the cow rather than the horse, in which animal it will be remembered the sternum lay almost in the same plane as the heads of the humeri.

The region of the shoulder blade and upper arm calls for no particular remark. Much of the surface modelling of the forearm is, even in a shorn sheep, obscured by the wool. The point which is, perhaps, of most concern to the painter in this section of the limb is the shape in which the wool grows. Your attention is rather called to this, in the same way as it was in the head when considering a dark-faced type, by the difference in the coloration of the long wool and short hair.

A sheep's knee is very full in front—there is in fact almost a suggestion of the pad which protects the knee of the goat. Immediately below the knee the leg is very small, but increases considerably in size towards the fetlock, the denser growth of the coarse hair which covers this joint increasing its dimensions, and at the same time rounding off any crisp or well-defined modelling which the bones of this joint might have imparted to the surface.

All existing species of wild sheep are essentially inhabitants of precipitous mountain regions and their small upright hoofs are well adapted by nature for locomotion on rocky ledges, where the foothold is small, and very little modification has been wrought by time and selective breeding in the foot of our domesticated race.

When viewed from the front the legs are seen to be set wide apart at the elbow, with a tendency to become knock-kneed.

This appearance is enhanced by a more abundant growth of wool being found on the upper external surfaces of the forearms than is present on the insides of the limb.

A sheep's back is broad and flat from the scapulas to the lumbar region, and as this feature is considered a desirable one in show beasts, an effort is not infrequently made by the shearers to accentuate it. In a show specimen this flattened surface should extend the whole length of the back and hindquarters, but in animals which the student is likely to encounter and be interested in we find that the back in the lumbar region assumes a distinctly domed shape. This, of course, will be most noticeable when the animal is viewed from behind.

The set-on of the pelvis as previously described imparts to the hindquarters a weak appearance of falling away towards the tail, a form which when it occurs in the horse is looked upon with great disfavour and is described as goose-rumped.

A further description of the form is rendered unnecessary as it is so largely concealed by the wool.

The difficulty of approaching sufficiently close to study sheep, without disturbing them, is a very real one. I would almost go so far as to say that it is hopeless to attempt it unless the flock is confined in a fold or other shelter. In excep-

tional instances when the animals are resting it is sometimes possible to get in touch with them for a short while, but the chances of doing this are so much against the artist that the loss of time entailed is hardly compensated for by the few sketches he is likely to secure.

The best opportunities of making close-up drawings of sheep occur when they are enfolded ; the animals cannot get away from you then, and what is more they will make no endeavour to do so if you enter their enclosure with reasonable precaution. Sheep which are kept (even part of the day) in a fold are generally much tamer than those which have the run of the fields or open country, and even if your first entrance into their enclosure causes a little perturbation they will soon get accustomed to your presence and will settle down again. In some parts of the country the ewes are brought into the yards and outbuildings for the lambing season, during which period they receive special feeding, and their frequent contact with humanity soon renders them extraordinarily docile, offering you a chance for study in more comfortable circumstances than you would be likely to find were you to attempt it in the open—for at this time of the year the cold wind makes your out-of-door sketching rather a Spartan performance ; in fact, it does more than this, as in spite of the fortitude with which you may endure the discomfort, if your fingers are numbed you simply cannot manipulate your pencil.

Now, with regard to the actual drawing of the

animal—these drawings from nature should in the early stages of the student's advancement be made solely with the idea of acquiring a familiarity with the animal and a knowledge of its proportions and construction. Later the student will endeavour to procure as complete and detailed representations of the animal in front of him as lies in his power, so that these drawings may be useful to him as references.

Even although he may agree with the author that he does not wish to introduce his animals into his pictures so close as to call for unlimited detail, nevertheless, it is as well that his studies procured under more favourable circumstances should be faithful and searching records. The knowledge he will thus obtain will enable him to suggest rather than to imitate laboriously the detail when the time comes to paint his picture. Any under features included in our studies can, if we are referring to them later, be eliminated from our pictures if so desired, but the reverse process is by no means so easy. It is very difficult to introduce detail accurately from memory, and it is far better left out altogether than added inefficiently without full knowledge of its make-up and significance.

On account of the restlessness of the animal it will not, of course, be possible to turn out complete, or highly finished drawings all the time, so your efforts from nature should be of two kinds —one to obtain finished drawings of part of the animal, and the other to make sketches of the

whole creature. It is as well to start your drawing with a clear understanding of your aims in this connection. Your energies are more likely to be rewarded if you confine your efforts to obtain finished drawings of animals lying in a position in which there is a probability of their remaining for some time. and leave the more unusual attitudes to be set down by the quicker method which aims at registering the proportions, poise, and action rather than at completion. The similarity which one member of the flock bears to another gives the artist a chance of continuing his drawing from another individual after his original model has moved from the position it was occupying when the drawing was started.

Pencil and charcoal work is for the painter but a convenient means to an end and should be regarded as such. The painter knows that he cannot hope to register accurately line, tone, and colour during the short time that the animal remains in one position ; he is, therefore, compelled to make his notes on which he intends to rely for the refinements of drawing in the medium which he finds most convenient to him, leaving himself free to devote all his attention to colour and tone when he is painting from nature.

Students, particularly when working in pencil, are inclined to handicap themselves by giving undue attention to the style of their work. Placing mere technical achievement before fundamental truths leads inevitably to meretriciousness. The mode by which you convey your facts is but

a trifling consideration—it is the facts themselves which must be your sole concern.

In an art centre where pencil work was encouraged, a drawing executed in line with the shadows indicated by hatching, or by a series of more or less parallel lines, would, if it received serious attention from the professor at all, be censured for its lack of fidelity, and the student would be told that his shading was not solid, and that the lines in his shadows represented nothing that was to be seen in the model—in fact, that he had adopted a vulgar convention only suited for cheap magazine illustration. In some other art schools an entirely opposite standpoint is taken, line work being insisted upon throughout the shadows, it being argued that any incompetent can make a smear which might luckily suggest the form required, but that the student who follows, or works across the form with the point of his pencil or charcoal, putting as much care into the shadows as he has into the outline, can hardly fail to gain a most valuable insight into the construction of the form he is endeavouring to realise. No doubt there is much to be said for both doctrines, but the student who has any initiative will develop a style suited to his own temperament and requirements.

You will be surprised how rapidly your pencil sketching from nature will improve if you make a regular habit of practising for a few hours daily for a month or two. The passages which used to present difficulties will, as you obtain a greater

mastery over your material, be rendered with spontaneity and freedom. You will learn by degrees to construct forms which have hitherto called for concentrated observation with a sympathetic touch born of familiarity with your subject and use of your medium. The easy and competent expressions of form is one of the most useful weapons in the armoury of the cattle painter, and for the acquirement of this efficiency persistent practice is essential.

As composition is such a necessity to any work of art we feel that a few remarks on this subject in general, and as applied to animals in particular, may not be out of place.

Pictorial arrangement is a matter for individual feeling, and it is difficult, therefore, to lay down any hard and fast rules to govern it; at the same time one can hardly discard all the accepted principles of composition and expect to produce even a moderately satisfactory decoration; and it is, after all, as a decoration that your picture primarily exists; it is not painted as a topographical record, neither are the animals treated from the point of view of a Zoologist. The author once heard a man who called himself an artist remark that he had no use for composition, and that nature as he found it and saw it was always good enough for him. If he really saw nature anything like he painted it he is deserving of our greatest sympathy, as life in the country must have been for him one long terrible nightmare. But the great point he missed was, that he had to compose

involuntarily what he saw (or thought he saw) whether he wished it or not. With the first line he placed on his canvas his composition had begun to materialize. Let us imagine that two individuals start to draw the same subject on the same shaped canvas from an identical point of view, both men determined that they are going to copy exactly what they see in front of them. We will further suppose that they are both successful in their undertakings. Now, if we compare their two drawings what is the result? Are they identical? By no means. The first man may have the principal objects of interest placed higher or more to one side than has the second man, or the proportions of the main group may be different compared with the size of his canvas. Or to put it in other words he may fill his canvas with his main group while the second man taking a wider angle of sight represents his principal objects on a much smaller scale. (Figs. 90 and 91.)

The possibilities of obtaining a variety of arrangements out of the same subject, while still adhering literally to nature, are almost unlimited. One man may feel that his design may be benefited by placing his horizon low in his picture, thereby giving dignity and height to his uprights, such as his trees and building, and also allowing him much more scope for the introduction of a fine sky; while another painter may be impressed by the glories of the reflection of trees, sky, and buildings and will elect to include a large portion

of the water in the foreground necessitating the sacrifice of some of the sky. (Figs. 92 and 93.)

The same principle, of course applies to the movement of your chief mass of interest either to the right or left as the case may be, and by doing either the whole composition will be entirely changed. But after all there is no rule which prevents the artist going much further than this. He need not feel that he is taking unwarrantable liberties with nature if he transposes from the position they actually occupy in nature such forms as he feels would serve his purpose better, if placed elsewhere in his picture.

Or, again, if he desires to do so he is at liberty to ignore in nature anything he feels is best omitted.

The successful transposition of an object requires some knowledge and experience, but to omit from his painting that which he does not need is comparatively easily accomplished.

Fine ready-made compositions are not met with at every bend of the stream, but nature supplies copiously to those who know how to look for it an infinite variety of material from which to select.

The problem which confronts the student is how to choose from and arrange this material to the best advantage.

When we look out over a stretch of country we view it with a wide angle of sight. We not only see the objects which we intend to paint, but we are also aware of the country to the right

and left of them—we feel that nature is unlimited. Immediately we begin to sketch in our masses we become conscious of the restricting influence of the four boundary lines of our canvas. But this is not our only difficulty. When looking at nature we are conscious that we are seeing it through

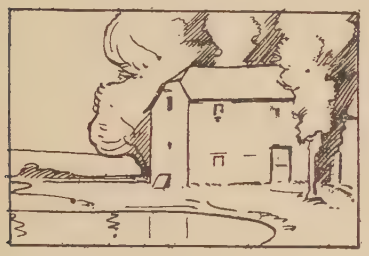


FIG. 90.

FIG. 91.

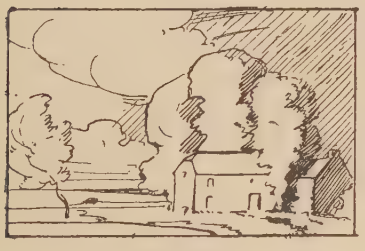


FIG. 92.

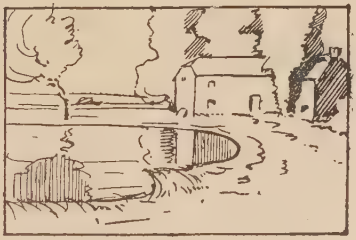


FIG. 93.

atmosphere—that we are looking into it. There is a sterescopic effect. It is obviously a hundred yards from where we stand, to, say, that group of trees ; a mile or two behind them runs a range of hills—beyond that, infinity !

Turning again to our canvas we become painfully aware of the limits which its plane surface imposes on us.

It is largely these limitations, these straight

uncompromising boundary lines, and the flat surface of our canvas, which makes it necessary for us to compose our masses so as to fill our canvas pleasantly and to arrange our leading lines so as to lure the eye of the spectator to travel into the picture, and to help him to forget that he is gazing at a flat surface.

The student, it is hoped, will, after these few remarks, be in no doubt as to the necessity for composing his picture.

One of the first matters that will claim his attention in this connection is balance.

Good balance is obtained in a picture by a proportionate distribution of mass ; not necessarily an exactly equal distribution—in fact, generally speaking, repetition of exact measurement in pictures is best avoided as it gives an unpleasant feeling of stiffness and formality to the design and often rather tends to call attention to the uprights and horizontals of the frame. It is not by any means always essential that mass should be balanced by mass. Interest will balance mere bulk, particularly when animals or figures are introduced as a counterpoise to inanimate but much larger forms. (Figs. 94, 95, 97 and 98.)

A picture which is faulty in balance will never be a pleasant one to live with.

Take care when spacing out your picture to avoid dividing your canvas into fractions which are too easily recognisable. Avoid halves, quarters and thirds, use for preference such measurements as five and three-eighths. For instance a marine

painter would not cut his picture in half by drawing his horizon line across the middle, neither would he go out of his way to call attention to the exact points where half a quarter way along his picture would fall, as has been done in Fig. 96. Spacing of this kind advertises the fact that your design is fitted into a rectangle.

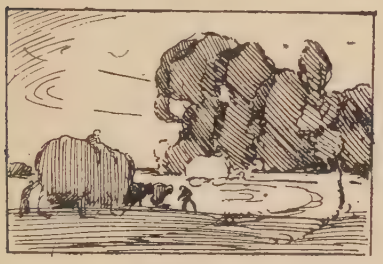


FIG. 94.

FIG. 95.

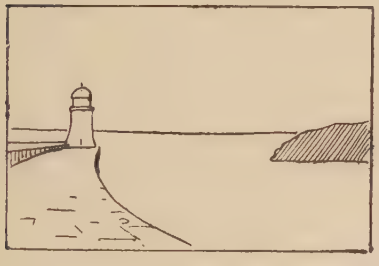


FIG. 96.

FIG. 97.

When planning out your scheme of arrangement there should never be any doubt as to whether your masses of light or your masses of dark predominate—there should be no equality between them; aim at working your lights into your dark masses, thus making a well-defined pattern. (Fig. 97.)

If your picture is capable of being reduced to

the simplicity of a poster by the elimination of superfluous detail and the reduction of the larger masses to flat tones, then you may have reason to feel that you have been successful in putting together the elements of a sound composition.

Design your composition both in mass and in line ; a line drawing will look very different after the tone is added.

Do not cut up the edges of your groups or masses unnecessarily. Let your principal curves be as simple and unbroken as possible. If it is the edge of a tree you are dealing with do not fritter away the main purpose of its shape by breaking it up into a number of minor serrations.

If it is the sweep of a pond you are thinking about do not sacrifice its bold contours by introducing miniature capes and bays which can but serve to distract attention from the chief interests.

An error of composition which is not infrequently committed by beginners is that of placing two objects on exactly the same level, or sometimes this process is reversed and the two arresting features are placed one above the other. The effect so produced in either case is almost invariably unpleasant.

The student will notice, if he examines the arrangement of most good landscapes, whether they include animal interest or not, that they generally consist of two groups. The one group arrests and holds the attention in such a way as to preclude the possibility of the second group con-

flicting with it. Two groups of equal importance would be detrimental to a happy arrangement. Another point in this connection which is worth making a note of is the desirability of letting the groups overlap each other. If we except Fig. 96 which is included as an example of bad composition, all the other diagrams dealing with this subject demonstrate this point. They all consist of two groups. In Fig. 91 and 92 the trees and buildings overlap the pond. In Fig. 98 the trees and ricks overlap the cows, and so on.

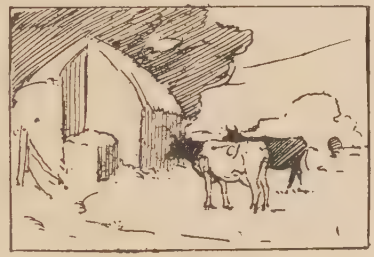


Fig. 98.

Do not forget when you are spacing out your masses, that the shapes between them are items not lightly to be ignored. These shapes do not, as a rule, force themselves on the attention much in nature ; it may be that their edges are not well defined or perhaps the movement of nature makes them less obvious. But when you are living with a picture you soon become aware of these patterns which are formed by the intervals which separate the more interesting masses. Remember then, that while you are outlining one object you are at the same time drawing the shape of these spaces. An example of this will be found in Fig. 94, which shows a shape made between the trees and the hay-wain.

Few students of composition have to pursue

their researches very far before they are told that on no account must an object of interest occupy a central position in their picture. No doubt there is a certain amount of justification for this ruling, for an accent thus placed may have the tendency to cut the picture in half or to accentuate the most easily recognised of all fractions, namely, the half way between the two uprights of the frame. The vital consideration is not so much to refrain from centering a notable feature as to avoid making such centralization obvious. There is a well-defined distinction between placing your interest right in the centre of the picture and placing it against the centre. Fig. 95 shows the right-hand wall of the cottage right in the middle of the canvas, and though this may not, perhaps be the exact spot one would have chosen for it, the fact does not obtrude itself offensively. The cottage is the interest and it is against the centre, not in it.

GROUPING

The grouping of the animals will naturally be a phase of composition which must claim the attention of the reader.

Animals often appear to group themselves very pleasantly in nature, but a snap shot of even one of the best of these groups will almost certainly reveal some glaring faults in composition.

The fact of the matter is that the impression conveyed by a crowd of restless animals may be all that can be desired, but it will not always bear

analysis. That which may seem all right in the movement of nature will not be so satisfactory when registered immovably in your picture. Your camera may, and probably will, supply you with some useful facts, but it is on your own feeling that you must rely for a decorative arrangement.

A painter when composing a group of standing human figures often has a difficulty in getting away from the insistent upright lines made by the erect figures of man. The animal painter is faced by a similar problem when dealing with a cattle group. The horizontal line made by the backs of the animals is not infrequently very dominating in nature and offers an obstacle to be overcome by compromise or tactful readjustment. When horses are your subject and you are depicting them in a flat landscape, the line of their backs will be coincident with the horizon—that is, if you are standing up to paint them (the average man's eye being about on a level with a horse's withers) but of course if you take a low point of sight the difficulty will be met by a large portion of the animal appearing against the sky. In any case the raising of a head will break the objectionable line.

It is when dealing with cattle that the difficulty becomes more acute. The line made by the backs of a group of cows will be straighter than that made by horses, and a cow does not habitually raise its head high enough to help us much. One way of dodging this difficulty is to place your group on uneven ground. The flattest of the flat

fields contains many inequalities which though they may not be apparent are quite sufficient for our purpose. A very insignificant rise in the ground which would be almost imperceptible if covered with grass a few inches long, would be enough to raise the back of one member of your group above that of his fellows—or similarly if the hind feet of the beast are planted in a slight depression it will be enough to make an appreciable difference between the height of the shoulders and the hindquarters.

You may be able to exploit the varying sizes of your animals to some advantage in this connection.

Another point which is worth remembering when grouping animals is to be careful not to place one animal in front of another so as to cut it off exactly at the beginning or ending of any one particular segment of the body. You would not, for instance, represent two animals in profile with the nearer animal placed in such a manner as to obscure the head, neck, and forequarters of the other animal, thereby cutting off the forequarters exactly at their junction with the barrel. You would move one of the nearer animals forward or a little back.

In the same way, if you would wish to have your animal's legs cut off by the frame, do not let them be intersected exactly at a joint; such a proceeding calls unnecessary attention to the fact that they are cut off.

Again you should be particularly careful how

you let the neck and head of one beast show from behind another, as it is so easy to suggest a two-headed beast, or an animal with a head growing from both ends. Of course you would not be likely to commit such a folly if you were dealing with two animals only, but when you are struggling with the difficulties of arranging several creatures such slips are easily made and will pass unnoticed by you until someone calls your attention to it.

Perhaps one of the most troublesome things to cope with is the enormous number of legs that a comparatively small number of quadrupeds seem to possess. If you can manage to place some of the more distant members of your group so that their legs are obscured by the nearer animal's so much the better ; even then those that you can still see will give you plenty to think about. Be sure that each leg looks as if it belongs to its rightful owner, and try to avoid the outline of one leg repeating exactly the outline of another immediately in front of it. This is the sort of awkward repetition which is likely to occur in photographs from nature and will require readjustment.

It will be found a help if you can think of what a plan of your group would look like. A good group is more likely to stand on a plan which has a harmonious sense of rhythm than on a plan composed largely of right angles. Animals standing at right angles to each other look rather stiff and formal. It is desirable, however, to consider

the plan not only for the sake of the decorative appearance of the group but also to make certain that it is possible to fit the animals into the spaces you have allotted to them.

A glance at the accompanying diagrams, Figs. 99, A and B, will make this point clear. The sketch of the plan shows that with the feet of the distant horse placed as indicated in the drawing there would be insufficient space for the head and neck.

Fig. 99A.

Let your group be solid and statuesque.

Spaces showing between portions of the animal attract attention unpleasantly, especially when the animals are silhouetted against the sky, as then these holes through the group appear so much lighter than they actually are.

You may be able to help your composition and add interest to the group by exploiting the local colours and marking of your animals. Cows lend themselves admirably to this kind of patch-work treatment. You are able to introduce a greater collection of variously marked animals into your pictures to suit your purpose than you are with horses, without causing comment. Pie-bald and skew-bald horses are decorative enough, but somewhat reminiscent of a travelling circus.

Light animals against dark and dark against light ones, or a patch of light or colour judiciously placed, are all valuable assets to the cattle painter,

particularly when the effect he is painting is a grey one or if the sunlight falls full on the group. Should, however, the sun be behind this group the student's first thought must be for the effect of light and shade, and from this he is in danger of detracting if he pays undue heed to the local

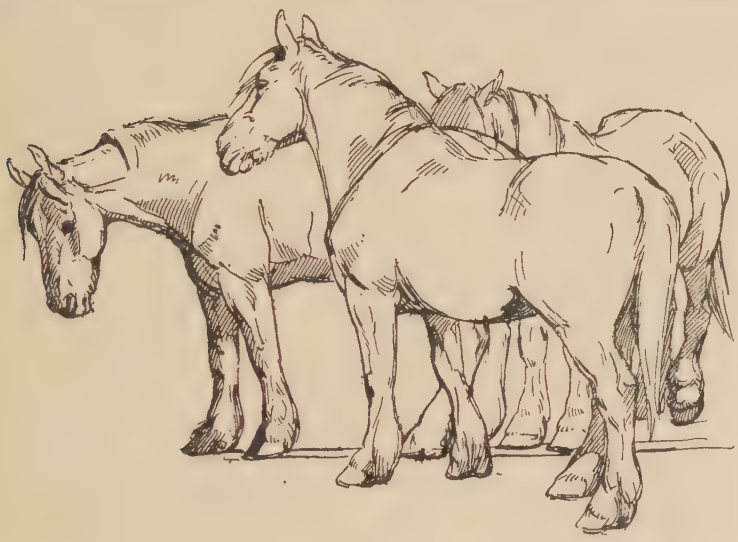


FIG. 99B.

colours. This effect is always of the simplest, the tendency being for all colours in the shadow to unite into one tone, thereby enhancing and giving value to those portions of the picture which are in sunlight.

Your group will gain in dignity if the line which encloses it is not broken by frequent interruptions. This, of course, is a remark which applies to the boundary of any mass considered from a composer's standpoint. The chief feature of a bold

line may be so easily wasted if embellished with insignificant trivialities.

The student with a natural feeling for the decorative will easily recognize the truth of the above, but he will none the less frequently experience difficulty in putting the theory into practice when he attempts to do so with living creatures for his material.

He may feel that the general effect of his picture will be greatly improved if the silhouette of his group makes a certain shape at one particular part of its outline, but the introduction of this form may necessitate the inclusion of another animal which will upset his arrangement elsewhere.

This is the sort of difficulty which everyone has to contend with and overcome in his own way. There are no recipes which can be doled out to meet every case. A very small alteration or addition will sometimes be enough to give you exactly what you require. It may be but the slightest turn of a head.

Good and really original groups of animals are scarce, the fact of the matter being that cattle painters have always been attempting fresh methods of composing their subjects, but have generally ended in returning to a well-worn arrangement—not with any idea of copying that which has been done before, but simply because having tried others, the old way has been found to be the most satisfactory.

To quote but one instance of this repetition : A pair of horses drinking has been made the

subject for a picture times out of number, and at a generous estimate only five per cent. of these pictures show both the animals with their heads down. Experience has shown that the most pleasant grouping can almost invariably be obtained by depicting one animal with the head up and the other with it down.

Satisfactory results are more likely to be

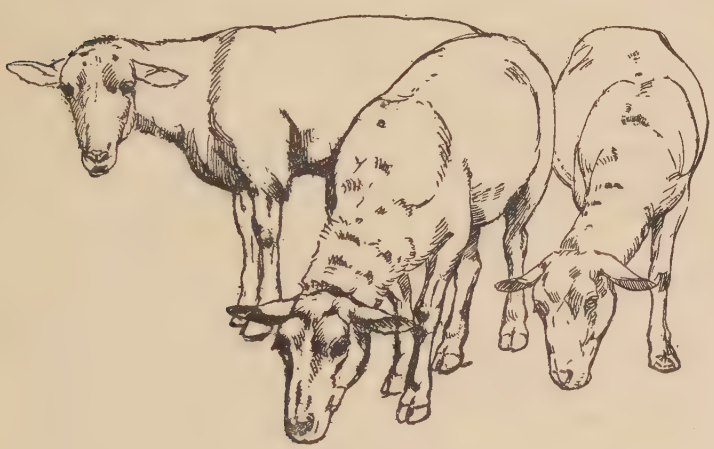


Fig. 100.

obtained by letting the line which forms the top boundary of your group have a decidedly convex tendency rather than the reverse, as the former line imparts dignity and strength, while the latter suggests weakness and will be found awkward to deal with in other ways.

It is, however, as remarked above, quite impossible to lay down a formula for the composition of a picture or for the grouping of animals, and it by no means follows that if the information

given above is carried out by the reader he will necessarily be successful in composing a good picture. The difficulty of imparting knowledge on this subject lies in the fact that it is so much a matter of individual taste, no hard and fast rules being absolutely inviolable.

If the arrangement is too obvious you may, however, feel sure that the composition of your picture leaves something to be desired; your picture should not *look* composed, there being such a thing as over-composing a subject.

It is undoubtedly possible to cultivate a sense of composition by constant practice; a short time spent every day with a sheet of tinted paper, a pencil, and a piece of white chalk will help the beginner to develop his feeling for pictorial arrangement.

When making sketches with this object in view, the qualities of drawing are of no account—it is the balance and proportion of the masses, and the rhythmic properties of line which matter here.

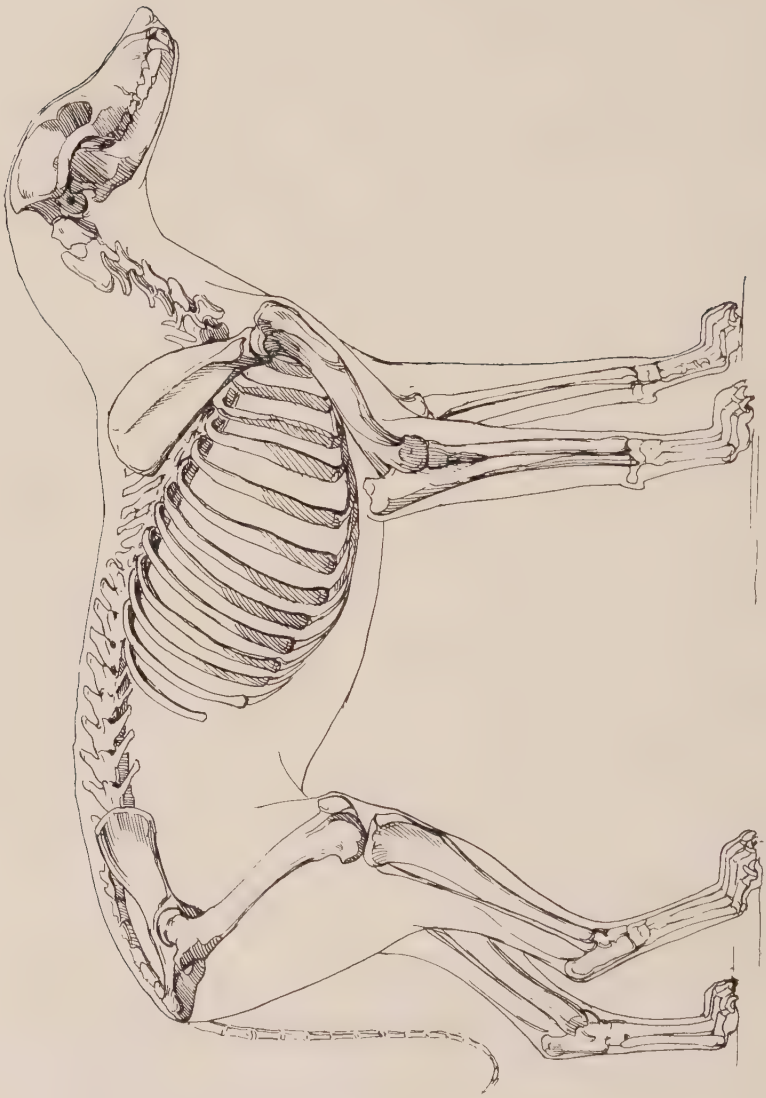


PLATE V.

[*Face page* 195.

CHAPTER IV

THE DOG

As the different species of dogs present such infinite variations of size, form, and coat, we will begin by examining the important characteristic of the dog tribe collectively before we proceed to consider in greater detail one or two of the more typical of our domesticated breeds.

When regarded from an artist's standpoint in relation to the three animals already dealt with, we find that the most outstanding characteristics of the dog family (freaks included) are the length and pointedness of the muzzle and the presence of five perfect toes on the forepaws and four on the hind.

Loose folds of skin are often present in the dog in the region of the neck and shoulders where they are of considerably more importance to the artist than the individual muscles which they cover. The fold or flap of loose skin which goes from the front of the thigh to the belly is very conspicuous.

A brief survey of the skeleton will probably be helpful to the student in showing him what to look for.

The appearance of triangularity on which we remarked when studying the skulls of the hoofed animals is not so evident in the dog. The features which impress us first, are (1) its length compared to its depth from the frontal bone to the lower jaw (2) the position occupied by the eye orbit is about midway between the occipital bone and the incisor teeth, (3) there is in the skull of the horse, cow or sheep nothing which corresponds to the depression which occurs on the outline of the dog's frontal bone on a level with the eye (Fig. 101).

In the front view the great breadth across the zygomatic arches emphasizes the pointed muzzle. The bony circle of the eye orbit is incomplete, being widely open posteriorly.

The cervical vertebræ of the neck, which are seven in number, call for no special notice.

The scapula differs considerably from that of the animals already dealt with, it being much shorter and more centrally divided by the spine. The spine of the scapula, it will be observed, is terminated at its lower extremity by a well-developed acromium process.

The shoulder joint is capable of a fair amount of lateral movement.

The humerus in typical dogs is long and well formed.

The bones of the forearm are in the dog and cat families quite separate and both fully developed. Their arrangement will present no difficulty to the student of human anatomy, but to

those who have had only experience of the construction of the hoofed animals the mechanism of this section of the dog's limb will introduce an unfamiliar feature.

The ulna, which is the longest bone in the skeleton of a normal dog, articulates with the humerus in the same manner as with the animals previously described, but instead of being welded to the radius, is separate for its entire length. It is large at the elbow and tapers towards its lower extremity.

The radius articulates with the external condyle of the humerus, and in the standing position crosses in front of the ulna about a third of the way down. This crossing of the bones of the arm is called pronation. The radius is capable of revolving on its button-like head at its articulation with the humerus, thereby uncrossing the bones and causing them to lie parallel with each other, and when in this position the bones are said to be in supination. As far as these actions of supination and pronation are concerned the ulna must be regarded as a fixture. It is the movement of the radius which enables the paw to rotate so as to describe about a quarter of a circle.*

It is owing to these movements of the forearm that it is possible for the cat or dog to lie in the familiar attitude with one paw flat on the ground and the other on its side.

The arrangement of the bones of the fore foot

* The human hand is by this action capable of rotating through half a circle.

is somewhat similar to that of the human hand. There are five metacarpal bones, that is, one to each digit. The shortness of the internal metacarpal, which is so apparent a feature of the human thumb, is much more marked in the dog, whose undeveloped thumb, or dew-claw, as it is sometimes called, is non-functional, and forms but a useless appendage. These metacarpals will hardly be looked upon as forming part of the true paw of the dog, inasmuch as the animal does not stand on this portion of the foot.

There are twelve phalanges in the true paw of the dog, i.e. three to each digit, terminating in a non-retractile claw.

The point to notice when comparing the extremity of the fore limb of the carnivora with the human hand, is that an animal walks on its fingers—the human, if he crawls, does so on the fingers and metacarpals. The amount of extension of which the human metacarpal-phalangeal joints are capable even under pressure is very limited, whereas in the cat and dog these joints may be extended to form at least a right angle.

The principal points to notice about the thorax are its smallness in relation to the cattle—the shortness of the first four or five ribs—and the distance of the last rib from the pelvis, or, in other words, the length of the lumbar region. The dog has one more vertebra than the ruminants.

The pelvis of the dog is small and simple in form and lacks the angular prominences which

constitute such outstanding landmarks in the hoofed animals.

The femur is long and thin, and bears some resemblance to the human thigh-bone. In typical dogs it is the bone of an animal built for speed rather than for strength.

In the lower leg the fibula is represented by a long thin bone, the head of which lies on the posterior surface of the head of the tibia. The inferior extremity of the fibula is important to the artist as it is the flattened termination of this bone which forms the external malleolus.

As far as the artist is concerned the remarks made referring to the relations of the bones of the fore foot to the human hand apply equally to those of the hind foot. Of course it will be recognized by the reader that while man stands with the sole of his foot from the tips of his toes to his heels in contact with the ground, the dog stands with the heel and metacarpals lifted well above the ground.

The great variability of the dog tribe makes it impossible to attempt to lay down anything like a table of proportions for dogs in general, and no useful purpose is likely to be served by compiling a list of measurements of a few selected breeds ; as a matter of fact, even the individuals of each breed are liable to differ considerably in proportion.

The artist who was taking up dog portraiture would, of course, make himself " au fait " with the points required by the judges of the breed he

was specialising in, but for all-round study the student cannot do better than take the head as a unit of measure and see how it compares with the measurements indicated as being of the same length in the diagram showing the proportions of the horse. Test also the animal's greatest height from the ground compared to its length. The greatest depth through the chest will

Fig. 101.

probably be found to be a more serviceable measurement than one taken through the girth.

There are certain structural characteristics common to all dogs which once appreciated enable the student to draw any breed after he has taken the trouble to make himself familiar with its peculiarities. This may appear at first to be rather a sweeping assertion, and the reader will be inclined to argue that the difference between two extreme types may be so great that a knowledge of the construction of the one cannot possibly be of any assistance to him when he

is drawing the other. The argument would, however, only hold good as regards the proportions; in other respects, such as the arrangement of bones and muscles, etc., the variations which take place are only matters of degree; the same essentials obtain throughout.

For example, the differences which exist between a Mastiff and a Pomeranian are so marked that they do at first glance appear to be representations of two distinct groups of animals. Yet, after all, apart from the question of size and proportion, the principal differences between the two animals are only superficial ones, such as the length and texture of the hair, or the way in which the tail is carried—or it may be that one animal has pricked ears and a pointed muzzle, while the other has a heavy jowl and hanging ears—the canine characteristics are present throughout both animals.

FIG. 102.

Let us then proceed to examine systematically from an artist's point of view the different parts of a representative animal. There will be no need to particularise at this stage of the proceed-

ings and the ensuing remarks may be read as referring to such animals as the Alsatian, the Collie, and the Greyhound.

Commencing with a profile view of the head, we find that the skull, as already described and shown in Fig. 101, is, as with the animals previously dealt with, entirely responsible for the form of

Fig. 103.

the anterior outline ; hence instead of the almost unbroken straight line which has assisted us when studying cattle, we now notice a depression in front of the eye which varies in degree according to the breed.

A straight line drawn from the occipital bone to the tip of the nose may prove helpful in determining the extent of this depression. In many instances such a line will pass through the top of the eye, as in Fig. 103.

The eye occupies a position midway between

the occipital bone and the tip of the nose. This remark applies equally—surprising as it may appear—to such dogs as a Greyhound and Pomeranian; the length of the muzzle being approximated by the distance from the eye to the back of the cranium in each instance.

Fig. 104.

Fig. 105.

The corner of the mouth is a very distinctive feature in the head and should be located in the initial stages of your sketch. It is, of course, a mobile point, the lips of the dog being operated by muscles which make it possible for the corner of the mouth to be drawn back very considerably, or again, when the muscles are relaxed and the head is down this point will

fall forward. This is particularly noticeable in loose-skinned hound types.

It will be noticed that while the general character of the forehead is dome-shaped a well-marked depression lies in the middle line of the skull. This feature is best observed in the foreshortened view; in this aspect the extreme width across the zygomatic arches is very apparent and tends to accentuate the convex curve of the forehead. (Figs. 104 and 105.)

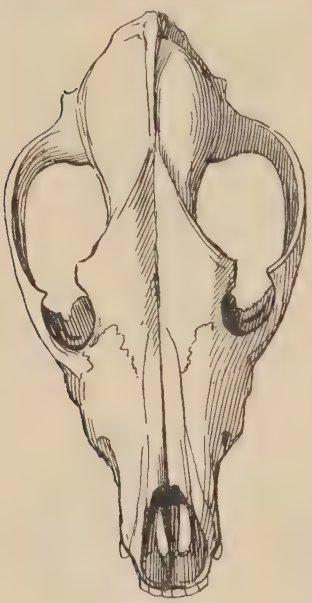


Fig. 106.

When viewed from above, the head may be divided into two distinct portions—one half lies posterior to the eyes, and the other, which broadly speaking is termed the muzzle, forms the anterior half of the head. When the relative proportions of these two main divisions have been noted the student may further assist himself by subdividing them. The ears divide the posterior half of the head in two and the prominence of the bones over the molar teeth forms a landmark which divides the muzzle into two equal lengths. (Figs. 106 and 107.)

One or two drawings of this view of the head should give the beginner an insight into the oblique way in which the ears are set on.

The depression in the skull above the zygomatic arch and posterior to the eye orbit is amply filled by the temporal muscles. The enormous development of the masseter muscles causes them to project beyond the limits of the zygomatic arches, thus forming the maximum width of the head.

Fig. 107.

The error which is most frequently made by beginners when drawing a dog's head occurs in the three-quarter front view. This is the failure to represent the nose in a parallel plane to the eyes. The fact that the middle line of the head from the occiput to the nose is not a straight one but makes a decided dip in the region of the eyes probably gives rise to this difficulty. Care should, therefore, be exercised to ensure that the muzzle continues the direction of the rest of the head, and that the lines on which the eyes and the nose lie appear in perspective to cross the

centre line of the head at right angles. (Fig. 108.)

To understand the drawing of the head it should be drawn from many points of view. When a live model is not procurable quite a lot may be learned from drawing the skull.

The dog's neck is circular in section. Think of the shape of a dog's collar compared to a horse's. Very typical features of the dog tribe noticeable in the front view are the two deep depressions which separate the group of muscles attaching to the head of the sternum from the mastoid muscles where they pass over the heads of the humeri. In short-haired animals of the greyhound type these depressions are very strongly emphasized.

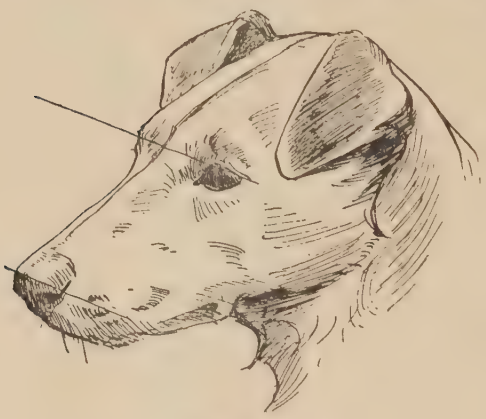


Fig. 108.

In the fore-limb we find that the scapula is but thinly covered by muscles and consequently the form of the bone is apparent on the surface.

The arrangement of the extensors of the fore-arm is somewhat different from that of the ruminating animals. The long head of the triceps muscle instead of having its origin on the angle of the scapula attaches several inches lower down the exterior border of the bone—moreover, the heads

of the muscle are fleshy and prominent, in marked contrast to those of the above-mentioned animals.

The disposition of the muscles on the anterior surface of this segment of the limb is not dissimilar to that of the animals already dealt with, but the biceps and more particularly the pectoral muscles are invariably less fleshy and massive.

The detachment of the fore-limb of the dog from the body above the elbow permits of a considerable freedom of movement. The student should remember when representing a dog in motion that the scapula will participate in any action made by the rest of the limb.

In the fore-arm the elbow is very pronounced, and the condyles of the humerus, as with most animals, are plainly discernible. The lower extremity of the radius is responsible for the prominence on the inside of the carpal joint and the ulna for the corresponding point on the external surface.

The somewhat complicated arrangement of the muscles of the fore-arm has more in common with man than with the hoofed animals, but a study of the anatomical detail of this neighbourhood is hardly an essential. A recognition of the position and general appearance of the main groups of muscles will be all that is required for artistic purposes, and the accompanying diagrams will probably supply the reader with all the information that he is likely to require on this subject more clearly than a verbal description. Figs. 109 and 110.

Perhaps the most striking characteristic of

EXTERNAL VIEW OF MUSCLES OF LEFT FORELIMB OF GREYHOUND

1. Mastoid-Humeralis.
2. Brachialis.
3. Extensor Carpi Radialis.
4. Extensor Communis Digitorum.
5. Radius.
6. Extensor Obliquus.
7. Pisiform Bone.
8. Flexor Carpi Ulnaris.
9. External Flexor of the Carpus.*
10. Extensor of the three External Digits.
11. External Condyle of Humerus.
12. Oleocranon Process.
13. Outer, or Short Head of the Triceps.
14. Long Head of Triceps.

* The External Flexor of the Carpus is sometimes referred to by veterinary anatomists as Extensor Carpi Ulnaris. It is true that in the human the corresponding muscle has this action implied by its name, but in the dog the action is that of a Flexor.

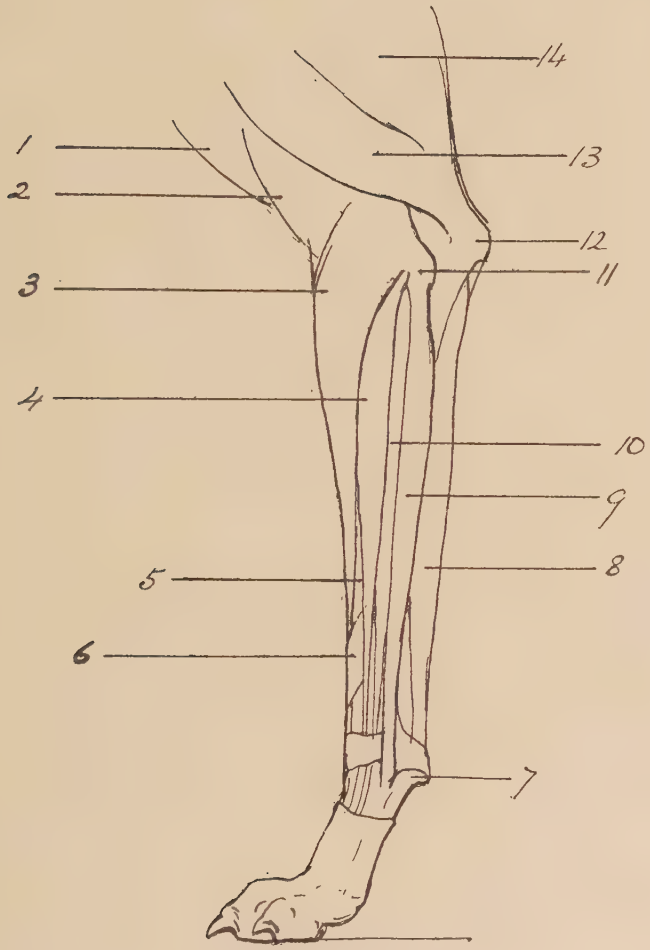


Fig. 109.

the dog's fore-arm is to be found in the deep groove, immediately above and behind the carpal joint, which separates the flexors of the carpus and foot from the ulna and radius. If a thumb and finger are inserted here on either side of the limb of a greyhound they will be prevented from meeting by only a thin layer of tissue. The little pad situated in the centre of the posterior of the joint is not of great anatomical importance to the animal, but it is by no means negligible from the point of view of form, as it makes a salient landmark in an otherwise long unbroken outline of the limb.

On the internal surface of the limb the form of the radius is very noticeable beneath the skin where its lower two-thirds are uncovered by muscles.

The metacarpal segment of the limb in the dog (and cat) calls for no particular remark, save, perhaps, to direct attention to its shortness in relation to most other animals. Its natural tendency in the standing position is to slope slightly forward as it descends, but in terriers, hounds and similar types uprightness in this region is, by breeders, considered to be essential to a good dog.

In the front view the similarity of the arrangement of the metacarpals to that of the human hand causes the increase in the breadth at their juncture with the phalanges.

The true foot of the dog, when we consider what a number of bones it contains, is small and very compact. It may be helpful when drawing

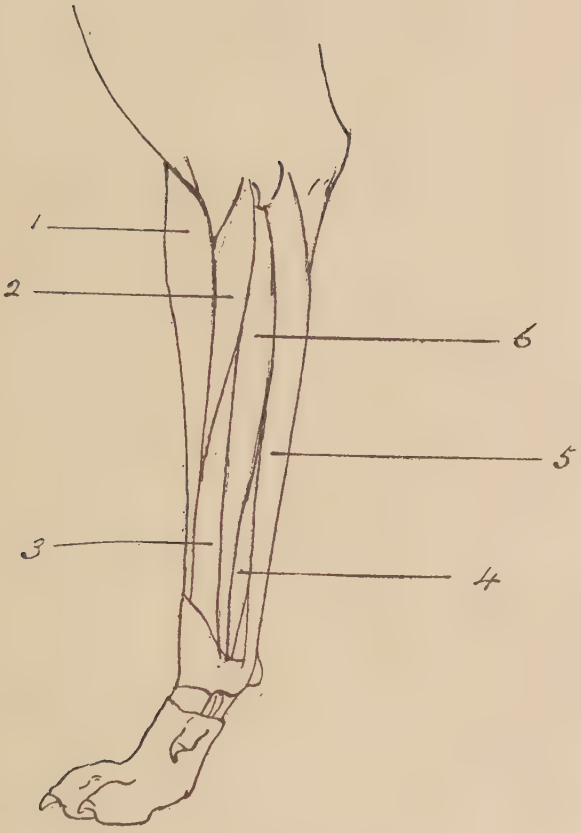


FIG. 110.

INTERNAL ASPECT

1. Extensor Carpi Radialis.
2. Pronator.
3. Radius.
4. Perforans.
5. Perforatus.
6. Flexor Carpi Radialis.

it from this aspect to regard the two middle digits (which are longer than the others) as being a pair. Sketch out the space which they are to occupy, noticing at the same time how close together the claws lie, and add the first and fourth digits afterwards.

Fig. 111.

Bear in mind the shape of the track made by a dog's foot. Fig. 111 shows the pads on the inferior surface of the foot.

The typical dog is deep chested from the shoulder to the sternum. A vertical section taken through the thorax immediately behind the scapula will reveal a tendency to what would be described as "pigeon breast" in a human.

With the exception of the back the dog's thorax is but sparsely covered with muscles, and the form of the bony structure is, therefore, responsible for much of the surface markings.

Loose skin and skin muscles (panniculus carnosis) obscure the form of the sub-structures behind the angle of the scapula. The last rib usually strongly demarks the posterior limit of the thorax.

The strong muscles which lie on either side of the spine make a flat superior plane. In the lumbar region the spines of the vertebræ frequently show on the surface, the extent to which

they make their presence felt being regulated by the muscular development and the amount of fat which the animal is carrying.

The inferior boundary line of the body varies considerably in character in different breeds, but the feature for which the student should look is its fullness where it is influenced by the sternum, and its upward and more concave tendency for the remainder of its length.

The most extreme example of this is to be seen in the greyhound, but in many modern breeds this part of the animal may be represented by almost a straight line. The extent to which the line of the stomach is inclined upward will, of course, regulate the measurement through the body immediately in front of the pelvis.

The iliac bones in the horse and cow, and in a lesser degree in the sheep, form very important prominences with their corresponding depressions lying anteriorly to them ; they separate the pelvis from the lumbar region in a decided fashion. In the dog these prominent features do not obtrude. The muscles of the back and loin of a healthy well-covered dog pass smoothly over the back, loins, and pelvis, their contours being unbroken by the bones of the sub-structure. The hind quarters do not have the detached appearance which is so noticeable in the animals just alluded to. Of course the student must not neglect to make himself familiar with the form and position of the bones of this region, as although they are not as a rule in evidence, in a thin smooth-haired

animal their presence is not infrequently apparent. For instance in a back view of a greyhound lying down the posterior crests of the iliacs are almost certain to make themselves felt on the surface.

The thigh carries a group of powerfully developed muscles which covers the trochanter of the femur. When viewed from behind, these bunches of muscle stand out very boldly—a measurement taken across them will give us the greatest width of the hindquarters.

The thigh is not tied-in and confined to the body in the same way as is the case with the hoofed animals, the lower two-thirds of the anterior border being free and unfettered, thus permitting considerable freedom of movement to the limb. The hip joint is, in fact, capable of almost the same degree of extension as that of the human.

The position of the stifle joint in relation to the line bounding the stomach will naturally be regulated by the length of the femur and the extent to which the inferior line of the body curves upward; but even in the most short-thighed, full-barrelled breeds this point is invariably quite detached from the body, in very marked contrast to the position it occupies in the cow, where the inferior line of the barrel passes well below the level of the stifle.

The angle at the back of the joint made by the thigh muscles crossing the gastrocnemius occurs more nearly on a level with the patella than it does in the hoofed animals.

In the dog, this angle is never very clearly defined in the normal standing position, and it is frequently obscured by the presence of long hair which borders this region in so many varieties. The straight legs demanded for the modern show dog of the terrier type also have a tendency to cause the blending of the posterior border of the thigh with that of the shank to become very subtle.

On the anterior border of the joint unless its modelling is obscured by the presence of long hair, the form of the patella and the head and crest of the tibia can usually be detected. In extreme flexions of the joint these details will show very plainly.

Reference to the accompanying anatomical diagrams, which represent two views of the hind limb of the greyhound, will give the reader a general idea of the disposition and form of the muscles of this position of the loins. Figs. 112 and 113.

The leg decreases considerably in calibre from the stifle to the hock. This is due to the replacement of the muscles by their tendons. The greater the muscular development the more marked the degree of tapering becomes. The level at which this decrease in bulk takes place varies in different breeds ; the hound types have the gastrocnemius high with a long tendon—in the spaniel the reverse is the case.

The length of the os-calcis to which the tendo-achillis attaches causes it to be separated from the

EXTERNAL ASPECT OF LEFT HIND-LEG OF GREYHOUND

1. Patella.
2. External Tuberosity of Femur.
3. Peroneus Longus.
4. Crest of Tibia.
5. Flexor Metatarsus or Tibialis Anticus.
6. Extensor Pedis.
7. Peroneus Brevis.
8. Tibia.
9. Short Extensor of the Toes.
10. External Metatarsal Bone.
11. Os Calcis.
12. Tendon of Perforatus.
13. Inter Muscular Space.
14. Perforatus, or Superficial Flexor of the Toes.
15. Perforans, or Deep Flexor of the Toes.
16. Gastrocnemius.
17. Semitendinosus.

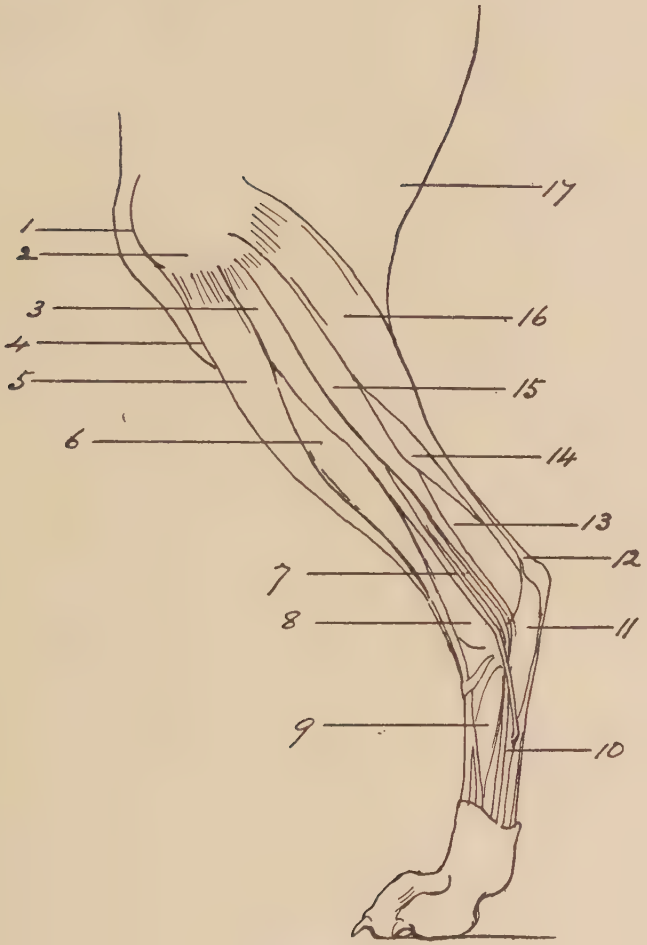


FIG. 112.

main-shaft of the limb by a wide and deep depression, the appearance of which must be familiar to everyone. The same bony landmarks of the leg, to which attention has already been drawn in the other animals above referred to, make their presence felt in the dog.

On the inside of the limb the internal face of the tibia is subcutaneous for its entire length.

The head of the external metatarsal bone is an extremely prominent and important feature, the presence of which the draughtsman should locate both in the side back and front views. The tendon of the peroneus-longus can be seen passing round behind the external malleolus on its way to its insertion on the head of the external metatarsal in precisely the same manner as it does in man.

It has been claimed for man, and not without reason, that in his structural development he is capable of greater variety of position and action than any of the animals. But when we consider this freedom of movement in relation to the dogs and cats we find that it surpasses their capabilities in a few important instances only ; whereas the lateral movements of the spine in these animals enable them to twist themselves into attitudes quite unattainable by even a contortionist. Man alone stands erect, we are told, but, after all, this fact, although it may impart dignity, does not give him any particular mobility or make it possible for him to adopt attitudes denied to the highly-developed carnivora—on the contrary rather, as this erect carriage, if it does not actually necessi-

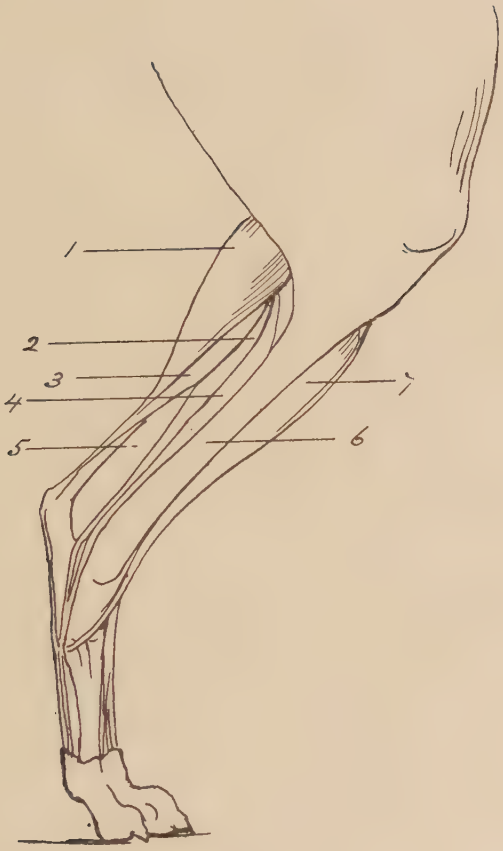


FIG. 113.

INTERNAL ASPECT OF LEFT HIND-LEG OF GREYHOUND

1. Gastrocnemius.
2. Perforans.
3. Perforatus.
4. Deep Portion of Perforans.
5. Inter Muscular Space.
6. Tibia.
7. Flexor Metatarsus.

tate walking with his heels on the ground, has caused him to acquire this habit—whereas the animal has the corresponding portion of the limb always clear of the ground when walking. It is in the movement of the fore-limb that man so vastly exceeds the facilities of the animals. The construction of the human shoulder joint and the arrangement of the muscles in this region allows the arm to be rotated freely in almost any direction. This forms a striking contrast to the restriction imposed on the animals, who, as it has already been pointed out, have but a limited power of lateral movement of the arms. The forearm of man is capable of a greater degree of supination and pronation than is the animal's, and the infinite mobility of the human hand far surpasses that of any other creature.

The idea that the superiority of man's form from an artistic standpoint vastly exceeds in beauty and subtlety all other living creatures is also almost universal, and accounts for the long periods of academic training which are usually devoted to this branch of art, quite regardless of what the student's ultimate objective in art may be—landscape, portrait, and animal painters alike serving this term of study of the nude.

The reason given for this method of training is that the delicacies and intricacies of the human figure make it the most difficult thing on earth to draw, and that if a student can draw the human figure well, other objects will present no insurmountable difficulties to him.

GREYHOUND.

[*To face page* 221.

It may well be that the human form will best fulfil the combined requirements of those who are taking up various branches of painting, as it is the only living creature with such a refinement and complexity of character which can be induced to remain stationary for a sufficient period to permit of prolonged or searching study ; but it will not be readily conceded by animal painters that the nude figure approaches the greyhound for mobility, refinement or grace. When we attempt to realize its infinite variety of form—its suppleness, combined with a suggestion of strength, we begin to appreciate what the difficulties of recording the quintessence of refinement really means.

It is to this animal, then, if procurable, that the student is advised to turn his attention when making his initial essays from the living animal.

The greyhound holds the premier position in the canine world for purposes of artistic study, not only for the qualities enumerated above, but because he shows the anatomy so clearly, and also it is much more satisfactory to draw from a moderately large dog than from a small one. The errors of the beginner will be more apparent if both the model and the drawing are of a reasonable size.

It is an enormous help to the artist if he can get anyone to look after and control the dog. Quite a lot can be accomplished in this way if the assistant is painstaking and intelligent. The dog also, when it gets used to its attendant, can be trained to stand in a way that it would never

do if left to its own devices. Old dogs are the best for beginners to start on. Youngsters are rather hopeless.

Much of what has been written above applies more or less equally to dogs in general, but, of course, knowledge of the characteristic points and blemishes of any breed which the artist desires to specialise in must be studied.

It is rather outside the province of this work to enter very fully into this matter from the breeder's point of view, as there are already publications which give all the information required in this connection. We will, however, take one breed and examine its points and construction.

Let us select for this purpose the ever popular fox-terrier.

Before attempting to draw from life, the student will be well advised to examine a large number of photographs of the breed of dog he proposes to specialise in. There should be no difficulty in obtaining these, provided the breed is not a rare one. So many illustrated papers reproduce good photographs of dogs, and all these publishers are willing to sell the original prints of the photo very reasonably.

From these could be compiled a table of the average proportions of a show-type; the table itself would be useful, but the knowledge of the breed gained by this practice would be considerable.

The beginner may at first be surprised that the individuals of the same breed vary so greatly,

SMOOTH COATED LABRADOR

BULL DOG.

[To face page 222.

but, nevertheless, he will soon recognize that the show animals are all true to type, and conform in a greater or less degree to the standard required of them by the judges.

As already stated, the eye in nearly every breed of dog occupies a position midway between the occipital tuberosity and the tip of the nose. This remark no longer applies to the fox-terrier, as the efforts of the breeders of the modern show dog have had the effect of abnormally extending the distance in front of the eye. As this measurement increases, so the " stop " (that is the depression on the anterior outline on a level of the eye) has tended to diminish. In the old type of terrier this dip in the outline was well accentuated.

The character of the superior outline of the face of a good terrier, while yet remaining true to type, is capable of infinite subtle variations, and must receive great attention if you hope to get a good portrait.

Having divided this line proportionately by locating the eye (slightly in the upper half), proceed to make the outline of the nasal bone compose with that of the forehead, by comparing their directions in the same manner as was indicated when dealing with the typical dog's head. Then observe to what extent the line of the nose varies from the straight. It may be slightly convex, and more rarely slightly concave, for its entire length—both types, if carried to extremes, are viewed with disfavour. The most prevalent type is one which shows a double curve. Starting

from the " stop " with a slight depression it rises in a subtle convex curve about half way between the eye and the tip of the nose. The exact position and extent of this change in direction must be carefully noted, as a small inaccuracy here will go a long way to destroy the likeness.

Another very important and somewhat variable characteristic to notice is the direction of the outline from the tip of the nose downward towards the mouth. This line generally makes a slightly acute angle with the superior line of the nose. You must be sure to place the point of the chin correctly where it shows beneath the upper lip, as undue prominence given to this point imparts an undershot appearance to the head which is a distinct blemish, while the reverse effect is not considered pleasant.

The inferior boundary of the head is nearly straight—it is not broken by the loose skin at the corners of the mouth as is the case in the hound types. In this connection it may not be out of place to call your attention to the rectangular effect produced on the head of a wire-hair terrier by trimming. While the hair on the under surface of the lower jaw is plucked and thinned from the throat as far forward as the corners of the mouth, the hair on the lips and chin is allowed to remain, and this is brushed forward so that the head of the animal is rectangular rather than pointed at the muzzle.

A poor set-on and carriage of the ears will do much to disfigure an otherwise good head. They

should be carried on the front of the head, and their tops should be turned over like inverted triangles when seen from the front.

The neck should not be too cylindrical, but should be, when viewed from the side, distinctly wider at its junction with the shoulders than at the throat. The neck, in spite of its length, should be reasonably strong, and the muscular development on the superior outline is suggestive of something in the nature of a crest. Do not be content to study the animal from one point of view only—make yourself thoroughly acquainted with it from all sides and angles. You will notice that the increase in bulk at the withers of a good terrier's neck is not nearly as marked when seen from behind as when a profile view is obtained.

The great depth of the chest which is looked for by the breeders of the modern terrier has given rise to some modification in the position of the scapula and humerus. The increased distance from the withers to the elbow cannot be spanned if they lie at the angle we find them in less highly-bred dogs. Thus it comes about that in show specimens the scapula is a trifle longer and the humerus more vertical. This departure from the normal brings the point of the elbow distinctly further forward in relation to the withers when the dog is at attention.

Very little indication of the chest will show in front of the muscular development on the anterior of the upper arm, and the simplicity of the line

which extends from the little prominence caused by the head of the sternum down to the feet will be punctuated only by the depression where the fore-arm grows clear from the body.

Some modelling and subtle drawing there may be, but if your object is to represent a prize-winner, your knowledge of anatomy in this region had better be suppressed rather than emphasized, as the boundary of this ideal leg may be delineated with a ruler in whatever view you are representing.

The metacarpal region should be quite upright. The anterior boundary continues that of the upper arm in an unbroken straight line.

In the front view, as with the hoofed animals, the upper arm should be in the same plane as the lower limb. There should be no hint of the turn-out of the elbow that we see in the bulldog and the daschound.

The chest should be deep, but not broad.

The back must be short.

The hindquarters should convey the impression of muscularity without being unduly encumbered. They should combine an appearance of reasonable strength with activity. The large bunch of muscles which forms such a prominent feature in the greyhound is not nearly so conspicuous in the terrier, who is decidedly flatter in that region.

The hindquarters ought not to fall away towards the tail, which should be well set-on, and carried vertically.

The distance from the hock to the ground should be short.

The table of proportions appended may serve as a guide to some of the measurements, but

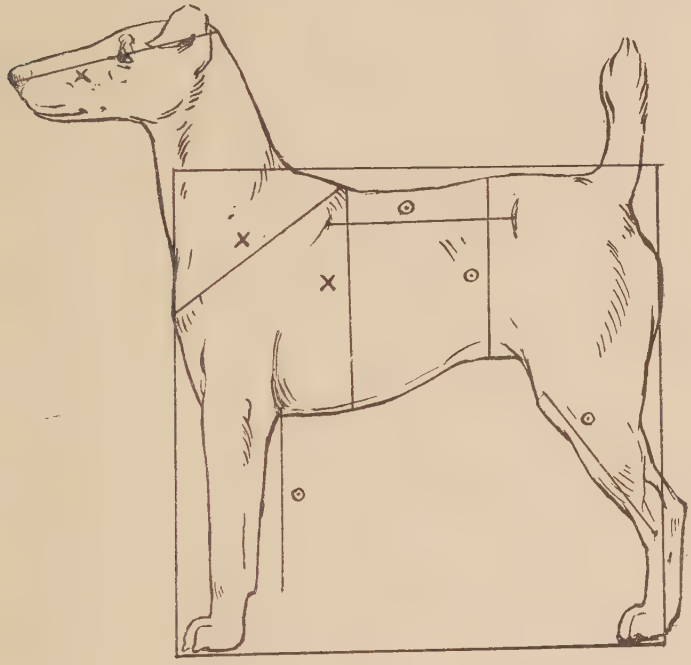


Fig. 114.

definite points are not easily picked out on a loose-skinned animal. (Fig. 114.)

The square measurement applied to the other animals holds good for the terrier; but it is of very little practical value, as the dog stands very differently from the hoofed animals. When a dog stands with both his feet well back (as he not infrequently does) the top of the hindquarters

must, as a consequence, be lower than when he is standing in the position shown in the diagram.

The measurements marked X are equal to the length of a head—those marked O are less than a head, but equal to each other. The nearly horizontal measurement is taken from the angle of the scapula to the haunch bone, and like the others is subject to a certain amount of variation.

CHAPTER V

THE CAT

Continental painters have bestowed on the cat some measure of the attention due to its undoubted decorative qualities, but British painters seem to have somewhat neglected the animal—it figures but rarely in their pictures, and even when it does, is generally introduced as an accessory, and it is very exceptional to find that it has been done justice to in any way.

Painters and illustrators we have certainly had (and still have, in very limited numbers) who have devoted some of their energies to the study of cats, but the former seem to have been chiefly impressed with their fluffiness, and the latter by their comic side. That a Persian kitten is fluffy it is impossible to deny, and for those whose sense of humour is attuned to appreciate the amusing side of the animal a funny side certainly exists. But, after all, a cat has some construction and is surely worthy of receiving serious consideration from the æsthetic point of view !—and there is also a wide opening for the activities of an expert cat portrait painter.

Considering that of all animals the cat is the

most accessible to everyone, it is strange that we can search our galleries in vain for cat pictures other than the worst type of pretty-pretty unconstructed fluffiness, or, at the best, an appreciation of commonplace surface beauty.

How are we to account for this reticence on the part of the artists? Are we to attribute it to indifference or incompetence? The reason can hardly be that the cat as a model offers insufficient artistic possibilities to the painter.

She is graceful and decorative, and has an infinitive variety of form and marking—furthermore, the artist has the great advantage of being able to place her in any sort of surrounding he pleases. He can, if he chooses, build up a gorgeous colour scheme around her composed of cushions and curtains, or he can paint her in humbler but equally pleasing environment. Puss is just as much at home in the palace as in the cottage. But why confine yourself to interiors?

If the truth be frankly told, we are forced to concede that the cat as a model has proved to be a good deal too difficult for the painter.

Long, thin and delicate—a mass of muscle—beneath a deceptive covering of soft fur which seems to change her contours with every movement—never still unless asleep—little wonder that the painter fights shy of such a subject!

Full of quiet dignity and repose one moment, the next—some sudden impulse has electrified her into a thing of sinuous grace and lightning actions.

She is full of character; you cannot coerce

her—you cannot train her to be your servant—on the contrary she is not infrequently successful in reversing the position ! It is indeed work for a specialist !

The long, lithe body of a cat exhibits a combination of mobile grace and agility to be found in few other animals. Angular or pronounced bony forms nowhere obtrude to break the flowing superficial contours.

In the muscular arrangement the cat and dog have much in common, but the group of muscles which in the latter animal forms such an outstanding feature on the external surface of the thigh is replaced in the cat by a much flatter and less obtrusive form.

In the domestic representatives of the cat tribe the muscles never attain to that state of development which occurs in their larger cousins who rely on their activity and strength for their existence ; but instances are common where the muscles of a poaching or half-wild cat have reached by constant use a size far in excess of that usually seen in an average specimen.

One of the first things which strikes us when thinking of the structure of a cat in relation to the ruminants is the looseness of the skin, which instead of being stretched lightly over the body as in these animals, is quite "baggy" and hangs in a fold along the middle of the belly.

This loose skin combined with the thick coating of fur serves effectually to obliterate any surface modelling which otherwise might have

been noticeable. This is the case even in an emaciated specimen. You may be able to see that the animal looks in poor condition, but it is not until you take it into your hands and actually feel the protruding bones that you become aware of their presence.

A close study of the cat's skeleton, then, is not likely to be of any very great assistance to the student, provided that he has already acquired a working knowledge of the bony construction common to all the higher mammalia.

The skull, of course, does play an important part in determining the shape of the head, but even here its construction does not make itself felt to the same extent as it does in other animals.

The cat's skull is short and round—in the larger, wild types it is much more elongated. A cat's skull is easily procurable, and something can be learned by drawing it in various positions.

The nasal, molar, and frontal bones are those which affect the artist most. The eye orbit, it will be noticed, if reference is made to Figs. 115 and 116, is completely surrounded by a bony ring.*

The relatively large size of the orbit is still misleading as its presence is so slightly indicated on the living animal, but the student should be in no doubt as to the actual position the eye occupies in it. Fig. 117 will, perhaps, help to demonstrate this point—the dotted line showing

* The large members of the cat resemble the dog, in that the orbit is open posteriorly.

FIG. 115.

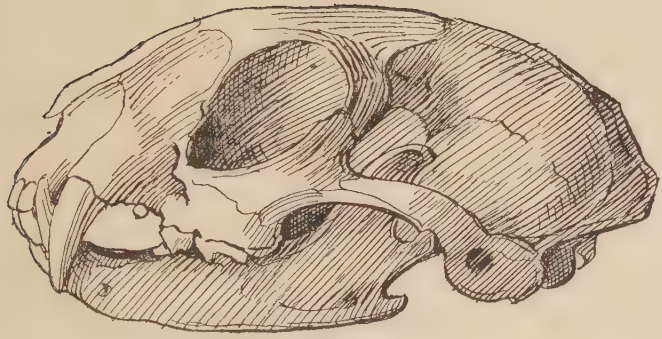


FIG. 116.

the limit of the orbit. It will be noticed that the upper eyelid is nearly an inch away from the posterior circumference of the orbit. Slight pressure applied at the point with the finger on the living animal will easily locate this bone.

The deep elongated cavity which lies posteriorly to the eye orbit is filled by the large muscles which operate the lower jaw.

Leaving the ear, for the moment, out of our consideration, we find that the cat's head is somewhat spherical in form and the planes of the head are ill-defined. It is this lack of definition—this subtlety—which makes the drawing of the head such a difficult matter. The form is so elusive, and there is so little that we can get hold of.

The full convex curve of the forehead occupies the greater part of the head; below this, the features are crowded rather close together. The eyes are very large; the nose, though it varies considerably, is generally surprisingly short. The well-developed whisker beds are a very distinctive feature in the cat's face, and in the more highly bred specimens this feature is developed to a very marked degree.

The chin is a very much more important feature in a cat's face than in the other animals we have dealt with—it being decidedly more prominent. In fact in the front view of the hoofed animals, even in a greatly foreshortened view, any little rudimentary chin which they possess is obscured by the fleshy portions of the lips, and in the dog (pugs, bull-dogs, pekinese, etc., excepted) the

CATS' HEADS.

[*To face page* 235.

amount of chin which shows below the lower lip is comparatively small.

The development of the chin is also very noticeable in the profile and gives a lot of character to the face.

Fig. 117.

The diagrammatic drawing on the left top corner of the opposite page, which shows the cat's head reduced to its simplest terms, will, it is hoped, prove of some assistance to the student in recognising the principal planes of a cat's head. These planes, however, merge into each other so subtly that it is almost impossible to define their exact limits.

The eyes are not placed in a lateral plane as with other animals, but occupy a more frontal position—more like that of the human—but the surface on which they lie is a curved one so that it can hardly be accurately described as a plane.

The way in which the eyes are set in gives rise

to a good deal of difficulty in representing them accurately in any but a dead-front view, as the slightest turn of the head will cause a very decided foreshortening of the far eye, any inaccuracy in the rendering of which will be very evident.

In the three-quarter view the lids curving round the convexity of the eye call attention to its spherical construction, for it must be realized that the portion of the eye which is visible, between the lids, is only a small part of the whole globular form.

The outer corner of the eye is decidedly higher than the inner, and also lies rather further back in the head.

The dilation and contraction of the pupils of the eye considerably affect the animal's expression. Under the influence of strong light the pupillary aperture becomes a mere vertical slit. Cat's eyes are brilliant reflectors—not only do they take a bright high light, but also reflect any other light object in their immediate vicinity. A white cat's eye will often reflect the side of her nose. Depth and beauty is given to the eyes by the shadow which is generally cast by the fringe of lashes bordering the upper lid.

When drawing the front view of the head it may be found helpful to draw lines from the tip of the nose to the outside corners of the eyes, and then complete the triangle by joining up the points. You will notice that the base of the triangle thus formed considerably exceeds, even in the longest nosed specimen, the length of either

of the sides. As in the human, the distance of an eye's breadth may be accepted as a standard measurement which separates the eyes—but no hard and fast rule can be laid down, as this measurement varies in individuals.

In point of size the little bare patch which contains the nostrils is unimportant, but terminating the nose, as it does, and not infrequently being of a different colour from the surrounding hair, it forms, next to the eyes, the most arresting landmark of the face. Its shape is that of an inverted triangle and is too familiar to everyone to require description. The item in connection with the nose which would repay a little consideration is the way in which it may be divided into upper and lower halves. If you look at the profile drawing of the skull you will see a decided little depression on the outline of the nasal bones. This corresponds to the depression indicated by the shadow on a level with the eye in the diagrammatic drawing of the white cat's head. The growth of the hair in this region further tends to accentuate the break or interruption in the line of the nose. The hair above this point is longer and softer than that on the lower half, which lies flat on the surface ; also the direction of its growth is different, as a glance at your model will show you.

This matter of direction and difference in texture of hair is an important one in a cat's head, but there is no need to labour the point here as the tendency with students is generally to

pay undue heed to the superficial and obvious and too little to the basic and fundamental; nevertheless there is one little point to which your attention might be drawn—that is, the great difference existing between the length and character of the hair covering the mallar bones and that which grows on the upper portion of the whisker-bed. The sudden change in the texture of the hair emphasizes the hollow under the mallar bone and helps to throw the whisker-bed out in strong relief.

The profile view of the head offers one something more definite to lay hold of. We note, first, the angle made by the forehead with the nose, then we observe the break in the nose referred to, and next (and this is, perhaps, the most definite angle in the head) we see at the lower extremity of the nose a right angle is made at its meeting with the little hairless portion surrounding the nostrils. Continuing round this corner we come to the prominence of the chin.

Next we look for the corner of the mouth and notice its position in relation to the eye. Have you ever realized how large a cat's mouth is? Its size impresses us every time she yawns, but when the mouth is shut, and its outline hidden and softened off by the whiskers we are apt to overlook its dimensions.

Observe the eye's position in relation to the nasal bone. (See sketch of profile.)

A cat's ear may be compared to a hollow cone which has been divided vertically into two equal parts—the concave portion facing to the front and

slightly to the side, while the convex or back of the ear faces in the opposite direction. This cone does not rest on a flat surface, but its base conforms to the convex contour of the forehead on which it stands ; thus the inner line of the ear is much shorter than the outer. This is more apparent when the head is tilted back so as to make the point at which the ear grows from the forehead visible on the outline. (See sketch opposite page 235.)

In the back view of the head the set-on of the ears is important. The external outline of the ear in this view appears to go almost to the base of the skull. (See third drawing opposite page 235.) You might also notice the position of the auditory hiatus in the skull (Fig. 116).

Looking at the cat's head in the three-quarter view, you will, owing to the oblique set-on of the ears, obtain a full view of the near one, and a perspective view of the far one, and you will also be able to see a small portion of the posterior surface of this ear. This is an item which might easily escape the notice of a beginner.

Notice the way in which the long hairs grow inside the ear. They begin at the lower inside border and spread across the cavity so as to form a screen of protection to the organ.

The desirability of suggesting the form of the substructure showing through the hair or fur of the animal has been insisted upon in these pages once or twice ; but any remarks made in this connection are intended in no way to minimize

the importance of the hair, the study and complete understanding of which would be invaluable to the artist.

Broadly speaking the direction of the growth of the animal's hair, which is subject to a certain amount of variation in different species, is influenced by two factors.

First, we find that the hair seems to be directed so as to assist the rain to run off the animal easily, and reasonable explanation is generally forthcoming for any marked divergence from this principle. For example, the oblique direction taken by the hair on the forearm may be accounted for by the fact that when the animal is lying down the hair on this portion of the limb will be excellently adapted to achieve this purpose.

The second determining factor is the necessity of offering a smooth surface to the wind. If the direction of the hair on a long-coated dog's back and side (such as a collie) were reversed, the animal's progress would not only be impeded, but it would suffer considerable inconvenience in cold climates from the wind getting under the hair. It is only on very limited areas of any animal that the hair grows forward, as for example the small portion of reversed hair on the flank of the horse.

The hair on short-coated animals such as the cow is comparatively unimportant, except in so far as it affects the light and shade.

A turn in the direction of the hair, which will cause you to look into it, will generally make the

CATS' HEADS.

[To face page 240.

area thus seen appear darker than that on which the hair is lying in an opposite direction. The same difference will in fact exist as would be noticed between a piece of satin and a piece of velvet of the same colour.

The general scheme of the arrangement of the hair on the cat and dog differs but little, at least in so far as the direction of the growth is concerned.

A detailed description of the length and shape of the hair groups or hair masses would make tedious reading; moreover, it is unnecessary, as the student will gain a far clearer insight into the matter by first hand study from the model than he is likely to do from reading many pages of type.

A cat's coat is composed of two distinct sorts of fur—first, the long straight hairs which predominate on the upper surfaces, and second, the more woolly growth which lies close to the skin and covers the inferior portion of the animal. The long hairs are a protection from the rain, and on the fur the animal relies for warmth.

As a cat is so easily obtainable and her portions are identical with those of the leopard, some artists who desire to obtain information about the construction of the larger representation of the cat family commence their investigations on the domestic animal. But there is something to be said for reversing this method of procedure. The smooth, short coat of the leopard allows the well-developed muscles and the position of the prominent bones to be more easily located than

is permitted by the longer fur of our domestic animal. The student also has the advantage of being able to observe the animal in motion better when in captivity, as it may walk around its cage incessantly. The cat, on the other hand, will not walk round the table for your benefit, and if she walks at all it is only to jump off. Your early studies, by the way, had better be made with the animal somewhere near the level of your eye.

The normal gait of the cat is a slow walk—it takes a surprisingly long, slinking step which brings the body low to the ground. The extended forearm slopes forward almost at the angle which would be assumed by other animals at the gallop, while the elbow of the leg supporting the weight of the animal is forced backward and upward so as to cause the humerus to lie almost horizontally.

The line from the heel to the ground is vertical when the hind-limb touches its maximum extension reached in the walk. When the limb is forward the line from the heel downwards makes a very acute angle with the ground.

A cat stands normally with the hindquarters slightly dropped, and the hind legs gathered under her ; the femur and bones of the lower leg make a more acute angle than we find in the dog, a pose which cannot fail to remind us of her springing power. It is only for a few consecutive moments that a cat stands up squarely on all four legs, as she does when arching her back. The hindquarters soon sink into a crouching position.

The student who earnestly desires to become even moderately proficient in drawing animals is advised not to take up this branch of art as a side issue, but for the time being, at any rate, to devote all his time to this one subject.

The difficulties and disappointments which, at best, he must expect to encounter are so numerous that he cannot afford to distribute his energies in other directions. If he should find that the sustained effort of concentrating on animals becomes irksome, he can vary the monotony by making a change in his medium. He will, of course, always draw those animals which he is fortunate enough to have held or tied up for him on a larger scale than he will those which are under no restraint, and are liable to walk away at any moment. For the larger drawings he is recommended to use charcoal—for the smaller ones pencil, either on white or tinted paper; in the latter case white chalk, used with discretion, makes an agreeable change.

Use the best materials—cheap and inferior substitutes are always unsatisfactory in the long run.

Good criticism, from someone who is more advanced than yourself, is always beneficial, but you must never lose sight of the fact that it is on your own efforts and incessant application that your ultimate success will depend, and without these no amount of teaching will avail.

To imagine that your drawing is likely to be improved in the slightest degree by the casual

scanning of the pages of a text-book would be futile in the extreme, but if the book is read intelligently, and a genuine effort is made to understand the principles of construction, and to study in the manner indicated, your work can hardly fail to benefit from the practice and knowledge you must, of necessity, thus obtain.

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